U.S. Department of Transportation
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DelDOT
Delaware Department of Transportation

# PARK AVENUE
# RELOCATION

## NOISE TECHNICAL REPORT

JUNE 2018

# PARK AVENUE RELOCATION

# Park Avenue Relocation Noise Technical Report

Delaware Department of Transportation (DelDOT)

Town of Georgetown in Sussex County, Delaware
Project Number: T201304601
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# Acronyms

| | |
|---|---|
| CFR | Code of Federal Regulations |
| dBA | A-weighted decibel |
| DelDOT | Delaware Department of Transportation |
| DNREC | Delaware Department of Natural Resources and Environmental Control |
| EA | Environmental Assessment |
| FHWA | Federal Highway Administration |
| FY | Fiscal Year |
| Leq | equivalent sound level |
| Leq(h) | hourly equivalent sound level |
| NAC | Noise Abatement Criteria |
| NEPA | National Environmental Policy Act |
| NSA | Noise Sensitive Area |
| ROFA | Runway Object Free Area |
| RPZ | Runway Protection Zone |
| TMS | Traffic Monitoring Sessions |

# 1.0 Introduction

The Delaware Department of Transportation (DelDOT), in cooperation with the Federal Highway Administration (FHWA), is evaluating the relocation and upgrade of Park Avenue in the southern portion of the Georgetown area in Sussex County, Delaware. Pursuant to the National Environmental Policy Act of 1969 (NEPA), as amended, and in accordance with FHWA regulations, an Environmental Assessment (EA) has been prepared to analyze and document the potential social, economic, and environmental effects associated with the proposed transportation improvements.

The purpose of this Technical Report is to identify and assess potential noise impacts associated with the Preferred Alternative. Information in this report, described below, supports discussions presented in the EA.

- **Section 1** presents an introduction to the Park Avenue Relocation Noise Technical Report;
- **Section 2** describes the methodology utilized to identify and assess noise impacts;
- **Section 3** provides an overview of the noise analysis, including existing noise conditions and development of predicted noise that may result upon implementation of the Preferred Alternative;
- **Section 4** evaluates mitigation measures; and,
- **Section 5** provides a conclusion of the analysis.

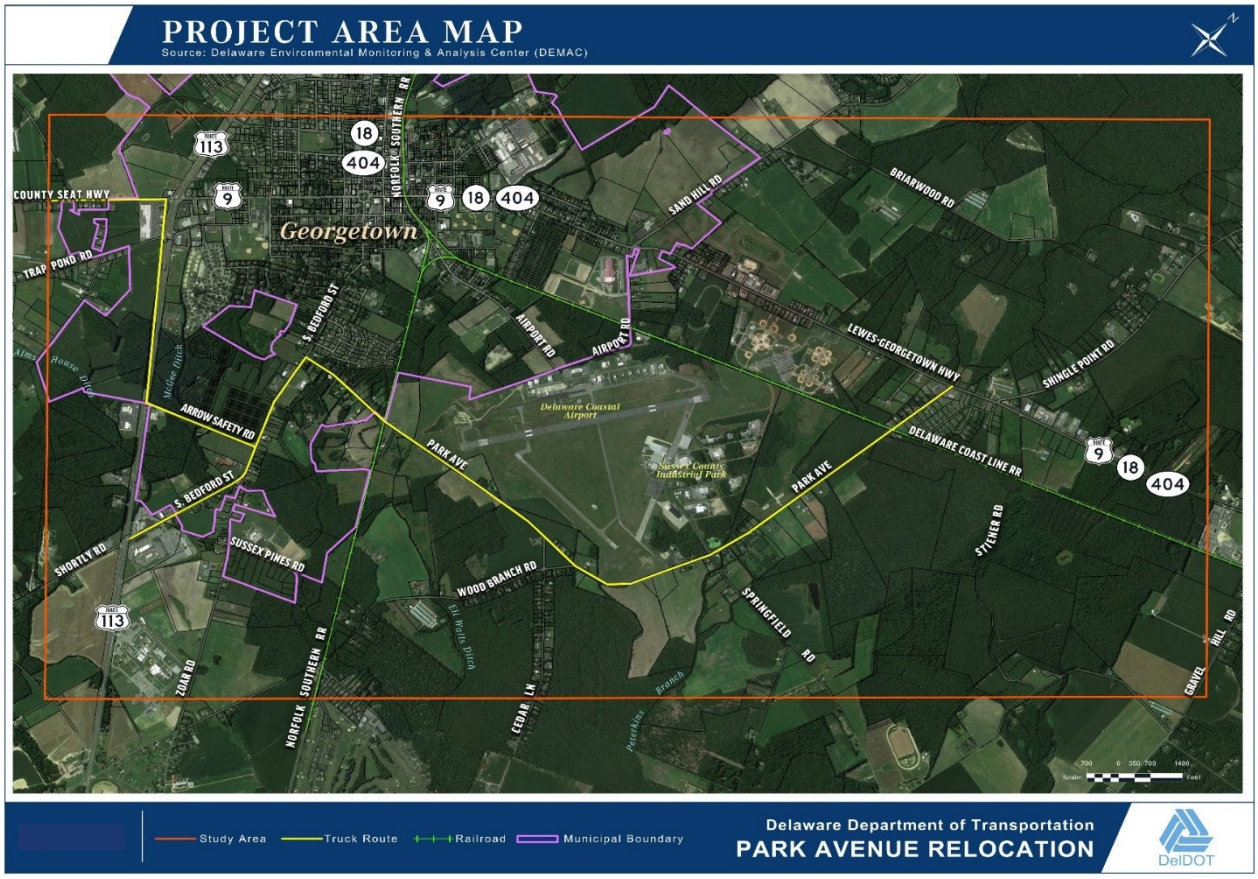
## 1.1 Description of the Study Area

The project's Study Area extends from one-half-mile east of Park Avenue to one-quarter-mile west of US 113, and includes the majority of the Town of Georgetown, the Delaware Coastal Airport, and the Sussex County Industrial Park (refer to **Figure 1-1**). The Study Area was developed based upon review of the land use in the area. The area in the vicinity and to the south of Park Avenue, South Bedford Street, and Arrow Safety Road is predominantly industrial or is planned to be industrial with pockets of residences, farmland, wetlands, and forested areas, as well as a new residential development planned north of Arrow Safety Road. The roadways further south of Park Avenue and South Bedford Street, such as Wood Branch Road, support low density residential development. Residential mixed with commercial uses border US 9 and DuPont Boulevard (US 113); while the majority of the vacant developable land between these roadways is designated for future residential development (Sussex County, 2008).

## 1.2 Background

Park Avenue, also known as US Route 9 Truck Bypass, is the designated truck route for tractor trailers moving through the area, providing access to the Sussex County Industrial Park, southeast of the Delaware Coastal Airport. Sussex County's 2017-2022 Capital Transportation Program Request has identified Park Avenue as a priority for improvement (Sussex County, 2015). DelDOT's Capital Transportation Plan for fiscal year (FY) 2017-2022, the currently approved plan, authorizes funding for preliminary engineering and right-of-way for the project (DelDOT, 2017). The report and plan note that the roads used for the truck bypass should be upgraded, with appropriate turn lanes and signalized intersections, and that the truck route should be realigned, removing the truck route from the existing residential areas of Park Avenue and South Bedford Street (Sussex County, 2015 and DelDOT, 2017).

**Figure 1-1: Project Area Map**




## 1.3 Existing Conditions

US 9 travels through the Town of Georgetown connecting Laurel, Delaware with Lewes, Delaware. West of US 113, US 9 is known as County Seat Highway; east of US 113, US 9 is known as Lewes-Georgetown Highway (refer to **Figure 1-1**). To eliminate truck traffic through the center of Georgetown, DelDOT designated a truck bypass which begins at County Seat Highway (US 9) west of Georgetown, then follows US 113, Road 87 (Arrow Safety Road), Road 431 (South Bedford Street), and Park Avenue, and reconnects with Lewes-Georgetown Highway (US 9) east of Georgetown. The five-mile bypass requires that trucks turn at five intersections and cross two railroads at-grade, the Norfolk Southern Line east of South Bedford Street on Park Avenue and the Delaware Coast Line south of Lewes-Georgetown Highway (US 9) on Park Avenue. The bypass is the only access route to the Sussex County Industrial Park and is a main route to the Delaware Coastal Airport (formerly the Sussex County Airport).

## 1.4 Purpose and Need

The purpose of the Park Avenue relocation, being undertaken by DelDOT, is to improve the traffic operations and safety of the US 9 truck bypass from east of Georgetown to US 113.

The primary need for the Park Avenue project is to improve traffic operations and safety. The existing truck route between US 9 and US 113 has several turning movements that hinder traffic operations, the roadway width is narrow and does not meet current design for a truck route, and the average number of crashes along the truck route between US 113 and US 9 is higher than the state and Sussex County averages.

Secondary needs are to support economic growth and to support federal, state, and local initiatives by focusing on improving transportation infrastructure to provide safe and convenient road access across the region and to areas zoned for business/industrial use.

### 1.5 Alternatives Considered for Evaluation

Conceptual alternatives that could potentially address the Purpose and Need for study were developed and then screened and compared by DelDOT during the conceptual design phase based on criteria developed to determine whether or not the identified elements of Purpose and Need would be met. The alternatives evaluated as well as the screening criteria are described in **Chapter 2.0** of the EA. Following is a description of the two alternatives carried forward for evaluation.

#### 1.5.1 No-Build Alternative

Under the No-Build Alternative, no improvements to or relocation of Park Avenue would be undertaken; however, routine maintenance of the US 9 truck route would continue. The No-Build Alternative would not satisfy the identified needs of the project as it would not improve traffic operations and safety along Park Avenue. The No-Build Alternative is also inconsistent with local plans and would not accommodate growth at the Delaware Coastal Airport (Town of Georgetown, 2010; Sussex County, 2008, 2015, and 2016). The No-Build Alternative has been carried forward in this EA as a benchmark for assessing the transportation benefits and environmental impacts of Build Alternative 6, the Preferred Alternative.

#### 1.5.2 Preferred Alternative

The Preferred Alternative would begin at Arrow Safety Road and straighten the alignment of the truck bypass by creating an additional leg at the intersection with South Bedford Street. The alternative would then travel along a new alignment to connect to Park Avenue east of the Norfolk Southern Railroad tracks. This alternative would avoid the runway object free area (ROFA) as well as the central portion of the runway protection zone (RPZ) associated with the proposed growth of the Delaware Coastal Airport, and minimize wetland impacts.

This truck route relocation would improve traffic operations by improving the roadway alignment and typical section, providing a continuous route around Georgetown, connecting US 113 west of Georgetown to US 9 east of Georgetown, and improving the Park Avenue and US 9 intersection and the Park Avenue and South Bedford Street/Arrow Safety Road intersection. The Preferred Alternative is consistent with local plans and allows for the future growth of the Delaware Coastal Airport as proposed by Sussex County, thus potentially encouraging economic development in the region (Town of Georgetown, 2010; Sussex County, 2008, 2015, and 2016).

## 2.0 Methodology

The Federal Highway Administration (FHWA) has issued guidelines for noise evaluation as established in Title 23 of the Code of Federal Regulations (CFR) Part 772, *Procedures for Abatement of Highway Traffic Noise and Construction Noise*. Highway traffic noise studies, noise abatement procedures, coordination requirements and design noise levels in 23 CFR 772 constitute the noise standards mandated by 23 U.S.C. 109(i). Design noise levels for various types of activity (land use) categories are summarized in the following section.

### 2.1 Criteria for Determining Noise Impacts

To describe noise environments and to assess impact on noise sensitive areas, a frequency weighting measure that simulates human subjective response to noise is customarily selected. A-weighted decibels (dBA) best approximate the frequency response of the human ear and have been found to correlate strongly

with human perceptions of the annoying aspects of noise, particularly from traffic noise sources. Consequently, dBA are the values cited by FHWA in its noise criteria indicated in **Table 2-1**.

**Table 2-1: FHWA Noise Abatement Criteria/Activity Relationships**

| Noise Abatement Criteria (NAC) Hourly A- Weighted Sound Level in Decibels (dBA) | | | | |
|---|---|---|---|---|
| **Activity Category** | **Activity Leq(h)[1]** | **DelDOT Approach Criteria[1]** | **Evaluation Location** | **Description of Activity Category** |
| A | 57 | 56 | Exterior | Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose. |
| B[2] | 67 | 66 | Exterior | Residential. |
| C[2] | 67 | 66 | Exterior | Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings. |
| D | 52 | 51 | Interior | Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios. |
| E[2] | 72 | 71 | Exterior | Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A–D or F. |
| F | - | - | - | Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing. |
| G | - | - | - | Undeveloped lands. |

[1] The Leq(h) Activity Criteria values are for impact determination only, and are not design standards for noise abatement measures.

[2] Includes undeveloped lands permitted for this activity category.

Because noise intensity fluctuates with time, an equivalent sound level (Leq) is commonly used as the descriptor of environmental noise in the United States. The Leq is the steady-state, A-weighted sound level which contains the same amount of acoustical energy as the actual time-varying A-weighted sound level over a specified period of time. For traffic noise, a one-hour period is typically used and reported as an hourly equivalent sound level, Leq(h).

The design noise levels indicated in **Table 2-1** have been used to determine highway traffic noise impacts associated with different land uses or activities in existence at the time of project design. Noise-sensitive

land uses potentially affected by the proposed improvements are in activity categories B, C, and D. For activity categories B and C, the Noise Abatement Criteria (NAC) is an Leq equal to 67 dBA at exterior locations for residential areas, active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings. For activity category D, the NAC is an Leq equal to 52 dBA at interior locations for auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios. When the predicted design year build alternative noise levels in the project area approach or exceed the NAC, noise impacts occur, and consideration of traffic noise reduction measures is necessary.

Per the NAC, a property in activity category B or C is considered impacted when the traffic noise approaches or exceeds 67 dBA and a property in activity category D is considered impacted when the traffic noise approaches or exceeds 52 dBA. In accordance with FHWA guidance on interpreting the words "approaches or exceeds," the impact threshold is 66 dBA for activity category B and C and the impact threshold is 51 dBA for activity category D. A property is also considered impacted when predicted design year noise levels substantially exceed existing noise levels. In accordance with FHWA guidance on interpreting the words "substantially exceed," properties that are predicted to experience noise levels twelve (12) dBA or greater than existing noise levels are considered impacted. Paragraph 772.11c of 23 CFR states that if a noise impact is identified, abatement measures must be considered.

### 2.2 Analysis Procedures

This analysis was conducted in accordance with 23 CFR 772 and current DelDOT procedures and policies including the State of Delaware Highway Transportation Noise Policy, Policy Implement No. D-03, Effective 7/16/11 (DelDOT, 2011).

Sound levels at the Park Avenue relocation project area were measured concurrently with traffic counts and speed counts so that the TNM model could be validated. FHWA Traffic Noise Model (TNM) version 2.5 was used to create a validation model. The model incorporates vehicle noise emission levels, updated for modern vehicle classification, traffic speed and traffic volume, sound propagation factors from atmospheric absorption, divergence, intervening ground, intervening barriers, and intervening rows of buildings and areas of heavy vegetation. The TNM validation model determines the legitimacy of predicted noise levels and noise abatement measures by evaluating the model's ability to reproduce the measured noise levels. Field data was input to the TNM validation model and the model was considered validated when modeled noise levels were within three (3) dBA of measured noise levels.

Once the model is validated, the proposed roadway alignment and design year traffic data are input for the Build Alternative to determine impacts due to traffic generated noise and to determine the effectiveness of abatement measures if necessary.

## 3.0 Noise Analysis

### 3.1 Sound Measurement Data

Short-term noise level monitoring was conducted on May 15, 2014 at twelve (12) sites within six Noise Sensitive Areas (NSA). An NSA is an area or group of noise sensitive land uses with similar exposure to highway traffic-generated noise. The short-term noise measurements were conducted during four Traffic Monitoring Sessions (TMS), each thirty (30) minutes in duration. During each TMS, noise measurements were conducted concurrently with traffic volume and speed counts along Arrow Safety Road, Park Avenue,

South Bedford Street, and US 9 within the project area. Noise monitoring was conducted between 11:30 AM and 3:35 PM. No accidents or events resulting in unusual traffic conditions occurred during noise monitoring sessions. Eleven (11) measurements were taken as locations classified as Activity Category B, and one (1) measurement was taken classified as Activity Category D.

Traffic volumes and speed count data used for TNM validation can be found in **Appendix C**. **Table 3-1** presents the location, Activity Category, date, time, and noise levels of the short-term field measurements.

**Table 3-1: Field Ambient Noise Measurements**

| Receptor | Address | Noise Sensitive Area | Activity Category | Date | Time | Measured Noise Level (dBA) |
|---|---|---|---|---|---|---|
| M-01 | 23422 Park Avenue | 6 | B | 5/15/2014 | 11:30am -12:00pm | 64 |
| M-02 | Saulsbury Lane Cul-de-sac | 6 | B | 5/15/2014 | 11:30am -12:00pm | 47 |
| M-03 | 22319 Park Avenue | 6 | B | 5/15/2014 | 12:25pm -12:55pm | 66 |
| M-04 | 22988 Park Avenue | 5 | B | 5/15/2014 | 12:25pm -12:55pm | 65 |
| M-05 | 22834 Park Avenue | 5 | B | 5/15/2014 | 12:25pm -12:55pm | 66 |
| M-06 | 22700 Park Avenue | 4 | D | 5/15/2014 | 12:25pm -12:55pm | 69 |
| M-07 | 22373 Park Avenue | 3 | B | 5/15/2014 | 2:20pm - 2:50pm | 71 |
| M-08 | Wood Branch Road/Cedar Lane | 3 | B | 5/15/2014 | 2:20pm - 2:50pm | 55 |
| M-09 | 22181 Park Avenue | 2 | B | 5/15/2014 | 2:20pm - 2:50pm | 69 |
| M-10 | 437 Bedford Street | 1 | B | 5/15/2014 | 3:05pm - 3:35pm | 69 |
| M-11 | 507 Bedford Street | 1 | B | 5/15/2014 | 3:05pm - 3:35pm | 71 |
| M-12 | 21142 Arrow Safety Road | 1 | B | 5/15/2014 | 3:05pm - 3:35pm | 66 |

## 3.2 TNM Model Validation

A TNM model was developed to reflect existing project conditions. Included in the model were roadways, terrain lines, ground zones, buildings, and noise measurement receptor locations. Roadway surfaces were input as “Average” in compliance with FHWA guidelines. The TNM model was validated by running four validation tests, one for each TMS, using the traffic data collected during the noise monitoring sessions. The model is considered validated when the modeled noise level are within three dB(A) of the measured noise levels. The results of the validation runs are shown in **Table 3-2**.

**Table 3-2: TNM Model Validation**

| Receptor | Address | Traffic Monitoring Session | Measured Noise Level (dBA) | TNM Modeled Noise Level (dBA) | Difference (dBA) |
|---|---|---|---|---|---|
| M-01 | 23422 Park Avenue | A | 64 | 67 | +3 |
| M-02 | Saulsbury Lane Cul-de-sac | A | 47 | 46 | -2 |
| M-03 | 22319 Park Avenue | A | 66 | 68 | +2 |
| M-04 | 22988 Park Avenue | B | 65 | 67 | +2 |
| M-05 | 22834 Park Avenue | B | 66 | 67 | +1 |
| M-06 | 22700 Park Avenue | B | 69 | 70 | +1 |
| M-07 | 22373 Park Avenue | C | 71 | 71 | 0 |
| M-08 | Wood Branch Road/Cedar Lane | C | 55 | 56 | 0 |
| M-09 | 22181 Park Avenue | C | 69 | 70 | +1 |
| M-10 | 437 Bedford Street | D | 69 | 69 | -1 |
| M-11 | 507 Bedford Street | D | 71 | 70 | -1 |
| M-12 | 21142 Arrow Safety Road | D | 66 | 65 | -1 |

As shown in **Table 3-2**, TNM modeled noise levels are within three dB(A) of measured noise levels at all twelve (12) noise monitoring locations and the TNM model is considered validated.

## 3.3 Impact Analysis

Future peak-volume traffic is used in the model to predict future noise levels at the desired receiver locations. The resulting future noise levels are used to determine the number and location of impacted properties. These impacts influence the design of mitigation alternatives if they are warranted.

FHWA requires noise to be analyzed in the “loudest noise hour” of the day. As noted previously, ambient measurements may not reflect the loudest hour of the day. The loudest noise hour traffic condition represents a combination of vehicle volume, classification mix and speed to produce the worst traffic noise condition that would be experienced along the project corridor.

The existing loudest hour noise levels were predicted by inputting 2014 peak traffic volumes into the TNM model developed for validation, which reflects the existing roadway and topography.

Future noise levels were predicted at receptor locations within influence of traffic noise for the Preferred Alternative. For the Preferred Alternative, the validation TNM model was updated to reflect roadway and topographic conditions as they would be after roadway improvements are completed. Design year 2040 traffic volumes were used in the model to represent future loudest hour noise levels. Predicted existing and future noise levels for the project area are shown in **Table 3-3**. Predicted noise levels were calculated to 0.1 dBA and then rounded to the nearest integer.

A receptor is considered impacted if design year predicted noise levels equal or exceed 66 dBA for activity category B or C or 51 dBA for activity category D (light grey shading) or if predicted design year build noise levels exceed existing noise levels by 12 dBA or more (dark grey shading) [for example, a receptor with an existing noise level of 47 dBA that is predicted to experience a design year noise level of 59 dBA or greater would be considered impacted].

Total impacts for each alternative, as shown on **Table 3-3**, are not determined by the number of impacted receptors, rather by the number of impacted properties that are represented by those receptors. Receptor locations are shown on **Figure 3-1**.

**Table 3-3: Predicted Design Year Noise Levels**

| Noise Sensitive Area | Receptor | Address | Activity Category | Existing 2014 Loudest Hour Noise Level (dBA) | Design Year 2040 Noise Level (dBA) | Increase in Noise Level over Existing (dBA) |
|---|---|---|---|---|---|---|
| 1 | R-01 | 21142 Arrow Safety Road | B | 51 | 56[1] | 5 |
| 1 | R-02 | 510 South Bedford Street | C | 46 | 51 | 5 |
| 1 | R-03 | 510 South Bedford Street | C | 58 | 61 | 3 |
| 1 | R-04 | 510 South Bedford Street | C | 53 | 57 | 4 |
| 1 | R-05 | 510 South Bedford Street | C | 51 | 54 | 3 |
| 1 | R-06 | 510 South Bedford Street | C | 49 | 53 | 4 |
| 1 | R-07 | 510 South Bedford Street | C | 48 | 52 | 4 |
| 1 | R-08 | 510 South Bedford Street | C | 48 | 52 | 4 |
| 1 | R-09 | 510 South Bedford Street | C | 47 | 51 | 4 |
| 1 | R-10 | 510 South Bedford Street | C | 61 | 62 | 1 |
| 1 | R-11 | 501 South Bedford Street | B | 55 | 63[1] | 8 |
| 1 | R-12 | 503 South Bedford Street | B | 55 | 60 | 5 |
| 1 | R-13 | 505 South Bedford Street | B | 57 | 59 | 2 |
| 1 | R-14 | 507 South Bedford Street | B | 57 | 59 | 2 |
| 1 | R-15 | 439 South Bedford Street | B | 55 | 59[1] | 4 |
| 1 | R-16 | 437 South Bedford Street | B | 55 | 61 | 6 |
| 1 | R-17 | 435 South Bedford Street | B | 57 | 59 | 2 |
| 1 | R-18 | 433 South Bedford Street | B | 57 | 59 | 2 |
| 1 | R-19 | 439 South Bedford Street | B | 47 | 60[1] | 13 |
| 2 | R-20 | 22577 Route 9 | B | 40 | 45 | 5 |
| 2 | R-21 | 22181 Park Avenue | B | 59 | 61[1] | 2 |
| 3 | R-22 | 22397 Cedar Lane | B | 51 | 55 | 4 |
| 3 | R-23 | 22397 Cedar Lane | B | 46 | 49 | 3 |
| 3 | R-24 | 22359 Wood Branch Road | B | 47 | 51 | 4 |
| 3 | R-25 | 22349 Wood Branch Road | B | 50 | 54 | 4 |
| 3 | R-26 | 22327 Wood Branch Road | B | 52 | 56 | 4 |
| 3 | R-27 | 22373 Park Avenue | B | 62 | 66 | 4 |
| 3 | R-28 | 22383 Park Avenue | B | 61 | 65[1] | 4 |
| 3 | R-29 | 22401 Park Avenue | B | 61 | 64[1] | 3 |
| 3 | R-30 | 22411 Park Avenue | B | 61 | 64[1] | 3 |
| 3 | R-31 | 22425 Park Avenue | B | 61 | 64[1] | 3 |
| 3 | R-32 | 22465 Park Avenue | B | 56 | 59[1] | 3 |
| 4 | R-33 | Delaware State Fire Marshall Office and the Delaware State Fire School | D | 61 (36) | 64 (39) | 3 |
| 5 | R-34 | 22700 Park Avenue | B | 56 | 59[1] | 3 |

| Noise Sensitive Area | Receptor | Address | Activity Category | Existing 2014 Loudest Hour Noise Level (dBA) | Design Year 2040 Noise Level (dBA) | Increase in Noise Level over Existing (dBA) |
|---|---|---|---|---|---|---|
| 5 | R-35 | 22700 Park Avenue | B | 55 | 58[1] | 3 |
| 5 | R-36 | 23318 Springfield Road | B | 58 | 62[1] | 4 |
| 5 | R-37 | 23330 Springfield Road | B | 53 | 56 | 3 |
| 5 | R-38 | 23323 Springfield Road | B | 62 | 65[1] | 3 |
| 5 | R-39 | 22794 Park Avenue | B | 55 | 58[1] | 3 |
| 5 | R-40 | 22834 Park Avenue | B | 53 | 57 | 4 |
| 5 | R-41 | 22878 Park Avenue | B | 53 | 57 | 4 |
| 5 | R-42 | 22910 Park Avenue | B | 54 | 57 | 3 |
| 5 | R-43 | 22794 Park Avenue | B | 54 | 57 | 3 |
| 5 | R-44 | 22988 Park Avenue | B | 55 | 59 | 4 |
| 5 | R-45 | 23022 Park Avenue | B | 56 | 59 | 3 |
| 6 | R-46 | 23260 Park Avenue | B | 59 | 63[1] | 4 |
| 6 | R-47 | 23269 Park Avenue | D | 61 (36) | 64 (39) | 3 |
| 6 | R-48 | 23276 Park Avenue | B | 59 | 62[1] | 3 |
| 6 | R-49 | 23289 Park Avenue | B | 59 | 62[1] | 3 |
| 6 | R-50 | 23294 Park Avenue | B | 57 | 60[1] | 3 |
| 6 | R-51 | 23303 Park Avenue | B | 59 | 62[1] | 3 |
| 6 | R-52 | 23521 Park Avenue | B | 57 | 60[1] | 3 |
| 6 | R-53 | 23319 Park Avenue | B | 58 | 61[1] | 3 |
| 6 | R-54 | 23522 Park Avenue | B | 58 | 61[1] | 3 |
| 6 | R-55 | 23333 Park Avenue | B | 58 | 62[1] | 4 |
| 6 | R-56 | 23338 Park Avenue | B | 60 | 63[1] | 3 |
| 6 | R-57 | 23349 Park Avenue | B | 56 | 58[1] | 2 |
| 6 | R-58 | 23348 Park Avenue | B | 61 | 64[1] | 3 |
| 6 | R-59 | 23365 Park Avenue | B | 59 | 61[1] | 2 |
| 6 | R-60 | 23376 Park Avenue | B | 61 | 64[1] | 3 |
| 6 | R-61 | 23377 Park Avenue | B | 57 | 58 | 1 |
| 6 | R-62 | 23396 Park Avenue | B | 63 | 65[1] | 2 |
| 6 | R-63 | 23688 Saulsbury Lane | B | 49 | 52 | 3 |
| 6 | R-64 | 23499 Ann Lane | B | 49 | 52 | 3 |
| 6 | R-65 | 23660 Saulsbury Lane | B | 49 | 51 | 2 |
| 6 | R-66 | 23648 Saulsbury Lane | B | 49 | 51 | 2 |
| 6 | R-67 | 23636 Saulsbury Lane | B | 50 | 52 | 2 |
| 6 | R-68 | 23624 Saulsbury Lane | B | 51 | 52 | 1 |
| 6 | R-69 | 23612 Saulsbury Lane | B | 52 | 53 | 1 |
| 6 | R-70 | 23600 Saulsbury Lane | B | 54 | 54 | 0 |
| 6 | R-71 | 23588 Saulsbury Lane | B | 56 | 56 | 0 |
| 6 | R-72 | 23303 Park Avenue | B | 49 | 51 | 2 |
| 6 | R-73 | 20673 Primrose Lane | B | 51 | 53 | 2 |
| | | | | | Total Number of Noise Impacts | 31 |

[1] Predicted noise levels at this receptor are less than 66 dBA, however the 66 dBA contour includes this property and it is therefore considered impacted.

The results from TNM modeling indicate that thirty-one (31) receptors representing thirty (31) residential noise sensitive land uses will be impacted by traffic generated noise. Thirty (30) noise impacts are predicted to occur as a result of predicted noise levels that equal or exceed the 66 dBA impact threshold and one (1) noise impact is predicted to occur as a result of a substantial noise level increase over existing noise levels. **Appendix A** of this report presents a Noise Receptor Location map displaying the location of each receptor used to evaluate the impacts and to develop the noise contours.

NSA 1 consists of nineteen (19) receptors representing ten (10) residences, a parcel owned by the Georgetown Historical Society, a church, and a museum. Predicted design year (2040) noise levels exceed the 66 dBA impact threshold at four (4) first row residential parcels (R-01, R-11, R-15, and R-19). Although noise levels at these receptor locations range from 56-63 dBA and do not equal or exceed the 66 dBA impact criteria, the 66 dBA impact contour includes noise sensitive areas on the parcels represented by these receptors. Receptors R-03 through R-09 represent the parcel owned by the Georgetown Historical Society and were set at different offsets from the relocated Park Avenue to determine noise level contours. Receptor R-02 represents the Georgetown Community Bible Church, and receptor R-10 represents the Nutter D. Marvel Museum. NSA 1 also contains land that is not noise-sensitive (Activity Category F), for consideration in future development and zoning, the 66 dBA noise contour is approximately 54 feet north of the future westbound edge of the roadway.

NSA 2 consists of two receptors representing first row residences. Predicted design year (2040) noise levels exceed the 66 dBA impact threshold at one of the residential parcels. Although the noise level at the receptor location is 61 dBA and does not equal or exceed the 66 dBA impact criteria, the 66 dBA impact contour includes noise sensitive areas on the parcel represented by this receptor. NSA 2 also contains land that is not noise-sensitive (Activity Category F), for consideration in future development and zoning, the 66 dBA noise contour is approximately 54 feet north of the future westbound edge of the roadway.

NSA 3 consists of eleven (11) receptors representing eleven (11) residences. Predicted design year (2040) noise levels exceed the 66 dBA impact threshold at six (6) first row residential parcels (R-27 through R-32). Although noise levels at these receptor locations range from 59-66 dBA and not all of the predicted noise levels at the modeled receptor locations equal or exceed the 66 dBA impact criteria, the 66 dBA impact contour includes noise sensitive areas on the parcels represented by these receptors. NSA 3 also contains land that is not noise-sensitive (Activity Category F), for consideration in future development and zoning, the 66 dBA noise contour is approximately 47 feet offset from both edges of the roadway.

NSA 4 consists of one receptor representing the Delaware State Fire Marshall Office and the Delaware State Fire School. There are no exterior noise sensitive land uses at this location so indoor noise levels were evaluated under Activity Category D in **Table 2-1**. Since the exterior of each of these buildings is composed of masonry material and modern air conditioning is installed, the reduction in noise levels in the interior as a result of the building is predicted to be 25 dBA per *FHWA Highway Traffic Noise Analysis and Abatement Policy and Guidance* (FHWA, 2011). The resulting predicted indoor noise level for the design year (2040) for R-33 is 39 dBA, which is below the 51 dBA impact threshold.

NSA 5 consists of twelve (12) receptors representing twelve (12) residences. Predicted design year (2040) noise levels exceed the 66 dBA impact threshold at five (5) first row residential parcels (R-33, R-34, R-35, R-37, and R-38). Although noise levels at these receptor locations range from 58-65 dBA and predicted noise levels at the modeled receptor locations do not equal or exceed the 66 dBA impact criteria, the 66 dBA impact contour includes noise sensitive areas on the parcels represented by these receptors. NSA 5 also contains land that is not noise-sensitive (Activity Category F), for consideration in future development and zoning, the 66 dBA noise contour is approximately 50 feet north of the future westbound edge of the roadway.

NSA 6 consists of twenty eight (28) receptors representing twenty seven (27) residences and a church. Predicted design year (2040) noise levels exceed the 66 dBA impact threshold at fifteen (15) first row residential locations (R-46, R-48 through R-60, and R-62). Although noise levels at these receptor locations range from 58-65 dBA and predicted noise levels at the modeled receptor locations do not equal or exceed the 66 dBA impact criteria, the 66 dBA impact contour includes noise sensitive areas on the parcels represented by these receptors. Receptor R-47 represents Saint James Anglican Church. There are no exterior noise sensitive land uses at this location so indoor noise levels were evaluated under Activity Category D in **Table 2-1**. Since the exterior of each of these buildings is composed of masonry material and modern air conditioning is installed, the reduction in noise levels in the interior as a result of the building is predicted to be 25 dBA (FHWA, 2011). The resulting predicted indoor noise level for the design year (2040) for R-47 is 39 dBA, which is below the 51 dBA impact threshold. NSA 6 also contains land that is not noise-sensitive (Activity Category F) and undeveloped land (Activity Category G). For consideration in future development and zoning, the 66 dBA noise contour is approximately 46 feet offset from both edges of the roadway. There are also offices in NSA 6, including the Sussex County Association of Realtors and retail space at the US 9 and Park Avenue intersection. However, these properties do not have any outdoor noise sensitive areas and were not considered for noise impact or abatement.

# 4.0 Mitigation Analysis

In accordance with 23 CFR 772 and DelDOT noise policy, noise abatement measures such as noise walls or berms have been considered in areas impacted by noise (FHWA, 2010 and DelDOT, 2011). Noise abatement is evaluated by feasibility and reasonableness criteria. DelDOT's noise policy outlines the following factors for evaluating noise mitigation measures:

- DelDOT will identify and evaluate impacts that noise abatement measures will have on the social, economic and natural environments when determining the feasibility and reasonableness of a noise mitigation project. An attempt will be made to provide noticeable and effective noise reductions of at least **9 dBA** at impacted receptors. For noise barrier and berm projects, this reduction is known as Insertion Loss. In order for any noise barrier construction to be considered reasonable under DelDOT policy, the barrier must provide at least a 9 dBA reduction in noise to at least twenty five percent of the benefited receptors.

- If noise barrier design cannot achieve at least a **5 dBA noise reduction for at least three impacted receptors**, then the construction of a noise barrier is not deemed to be acoustically feasible.

- Noise mitigation is cost-effective – not to exceed **$25,000 per impacted and also benefited property**. If this criterion is not met, the calculation will be modified to take into consideration any benefited receptors that are not considered impacted. Each of these benefited receptors that are not considered impacted will be given a weighted value equal to twenty five (25) percent of a benefited and impacted receptor.

- Noise mitigation is acceptable to the majority of people affected. In order to assure that the viewpoints of the "benefited receptors" are considered, DelDOT will compute the total number of owners and residents in the "benefited receptor" category, and will not make a decision on reasonableness unless at least sixty (60) percent of the total have replied in some manner. In considering the receptor viewpoint, only an explicit "no" to noise barrier construction will be considered as opposing the construction of a noise barrier. If more than fifty (50) percent of the total number of responding "benefited receptors" oppose the construction of the noise barrier, then construction of the noise barrier will not be considered reasonable.

When determining the cost-effectiveness of mitigation, all properties that receive a 9 dBA or more reduction in predicted future noise levels are considered to benefit from noise wall or berm construction. For the

purposes of this cost evaluation, a unit cost of $30.00 per square foot has been used for noise barrier panels and posts with heights of 24 feet or less. A unit cost of $35.00 per square foot has been used for noise barrier panels and posts with heights exceeding 24 feet. These cost figures are based upon current experience and reflect the cost of constructing a ground mounted noise wall system.

NSAs 1, 2, 3, 5, and 6 include noise sensitive land uses that are considered impacted by noise. After impacts are identified feasibility of noise abatement must be evaluated. Feasibility focuses on whether it is physically possible to build a noise wall given site constraints and whether a minimum acceptable level of noise reduction can be achieved. Given the right-of-way limitations and driveway access requirements, it is determined that it is not feasible and reasonable to construct a noise wall in any of the impacted NSAs. Driveway access to the residences would require gaps in the barriers and therefore limit the effectiveness of barriers. Berm mitigation was also considered, however Berms are not feasible to driveway access and right of way constraints (refer to **Table 4-1** and **Table 4-2**).

**Table 4-1: Preferred Alternative Barrier Cost Analysis**

| Noise Sensitive Area | Number of Impacts | Barrier Height (ft) | Barrier Length (ft) | Insertion Loss (first row) (dBA) | Barrier Cost | Benefited Residences | Cost per Benefited Residence | Comment |
|---|---|---|---|---|---|---|---|---|
| 1 | 4 | Driveway access to the proposed alignment prevents effective mitigation | | | | | | Mitigation not feasible |
| 2 | 1 | Driveway access to the proposed alignment prevents effective mitigation | | | | | | Mitigation not feasible |
| 3 | 6 | Driveway access to the proposed alignment prevents effective mitigation | | | | | | Mitigation not feasible |
| 4 | 0 | n/a | n/a | n/a | n/a | n/a | n/a | No impacts, mitigation not considered |
| 5 | 5 | Driveway access to the proposed alignment prevents effective mitigation | | | | | | Mitigation not feasible |
| 6 | 15 | Driveway access to the proposed alignment prevents effective mitigation | | | | | | Mitigation not feasible |
| | | | | **Totals:** | **N/A** | **N/A** | **N/A** | |

**Table 4-2: Preferred Alternative Berm Cost Analysis**

| Noise Sensitive Area | Number of Impacts | Berm Height (ft) | Berm Length (ft) | Insertion Loss (first row) (dBA) | Berm Cost | Benefited Residences | Cost per Benefited Residence | Comment |
|---|---|---|---|---|---|---|---|---|
| 1 | 4 | Driveway access to the proposed alignment prevents effective mitigation | | | | | | Mitigation not feasible |
| 2 | 1 | Driveway access to the proposed alignment prevents effective mitigation | | | | | | Mitigation not feasible |
| 3 | 6 | Driveway access to the proposed alignment prevents effective mitigation | | | | | | Mitigation not feasible |
| 4 | 0 | n/a | n/a | n/a | n/a | n/a | n/a | No impacts, mitigation not considered |
| 5 | 5 | Driveway access to the proposed alignment prevents effective mitigation | | | | | | Mitigation not feasible |
| 6 | 15 | Driveway access to the proposed alignment prevents effective mitigation | | | | | | Mitigation not feasible |
| | | | | **Totals:** | **N/A** | **N/A** | **N/A** | |

## 5.0 Conclusions

DelDOT noise policy requires that a noise assessment be completed to evaluate the impacts of traffic noise in the project area for the Park Avenue relocation improvement project. Where noise impacts are identified, feasibility and reasonableness of noise abatement must be evaluated.

Design year noise levels were predicted using TNM 2.5 and determined that 31 traffic generated noise impacts are predicted to occur within NSAs 1, 2, 3, 5, and 6. Given the right-of-way limitations and driveway access requirements, it is determined that it is not feasible and reasonable to construct a noise wall in any of the impacted NSAs. Driveway access to the residences would require gaps in the barriers and therefore limit the effectiveness of barriers. Berm mitigation was also considered, however berms are also not feasible due to driveway access and right of way constraints.

# 6.0 References

Delaware Department of Transportation (DelDOT). (2011). State of Delaware Highway Transportation Noise Policy, Policy Implement No. D-03, Effective 7/16/11.

Delaware Department of Transportation (DelDOT). (2017). Delaware Department of Transportation Capital Transportation Program for Fiscal Years 2017-2022. Accessed September 2017: http://deldot.gov/Publications/reports/CTP/pdfs/archived/ctp17-22/CTPFY17-FY22Complete.pdf.

Federal Aviation Administration (FAA). (2011). Environmental Assessment for Proposed 500' Extension of Runway 4-22 and Related Capital Improvements, Sussex County Airport, Georgetown, Delaware, July 2011.

Federal Highway Administration (FHWA). (2010). Title 23 of the Code of Federal Regulations (CFR) Part 772, Procedures for Abatement of Highway Traffic Noise and Construction Noise, July 2010.

Federal Highway Administration (FHWA). (2011). Highway Traffic Noise Analysis and Abatement Policy and Guidance, December 2011.

Sussex County. (2008). Sussex County Delaware Comprehensive Plan Update, June 2008.

Sussex County. (2015). 2017-2022 Capital Transportation Program Request, September 24, 2015.

Sussex County. (2016). Sussex County Economic Delaware, Explore. Excite. Excel. Accessed October 2016: www.excitesussex.com.

Town of Georgetown Draft Comprehensive Plan (2010). Urban Research and Development Corporation, Bethlehem, Pennsylvania, as adopted by the Georgetown Town Council, January 13, 2010.

# Appendix A – Noise Analysis and Mitigation Analysis Figures


0 300
Scale in Feet

**Legend**

- Land Use Activity Category A — Noise Sensitive Area (EXTERIOR)
- Land Use Activity Category B — Noise Sensitive Area (EXTERIOR)
- Land Use Activity Category C — Noise Sensitive Area (EXTERIOR)
- Land Use Activity Category D — Noise Sensitive Area (INTERIOR)
- Land Use Activity Category E — Noise Sensitive Area (EXTERIOR)
- Land Use Activity Category F — Non-Noise Sensitive
- Land Use Activity Category G — Non-Noise Sensitive
- M-XX ○ — Field Noise Measurement Location
- 59 — Measured Sound Level Leq(h) dB(A)
- 59 — TNM Modeled Sound Level Leq(h) dB(A)
- 0 — Difference Leq(h) dB(A)

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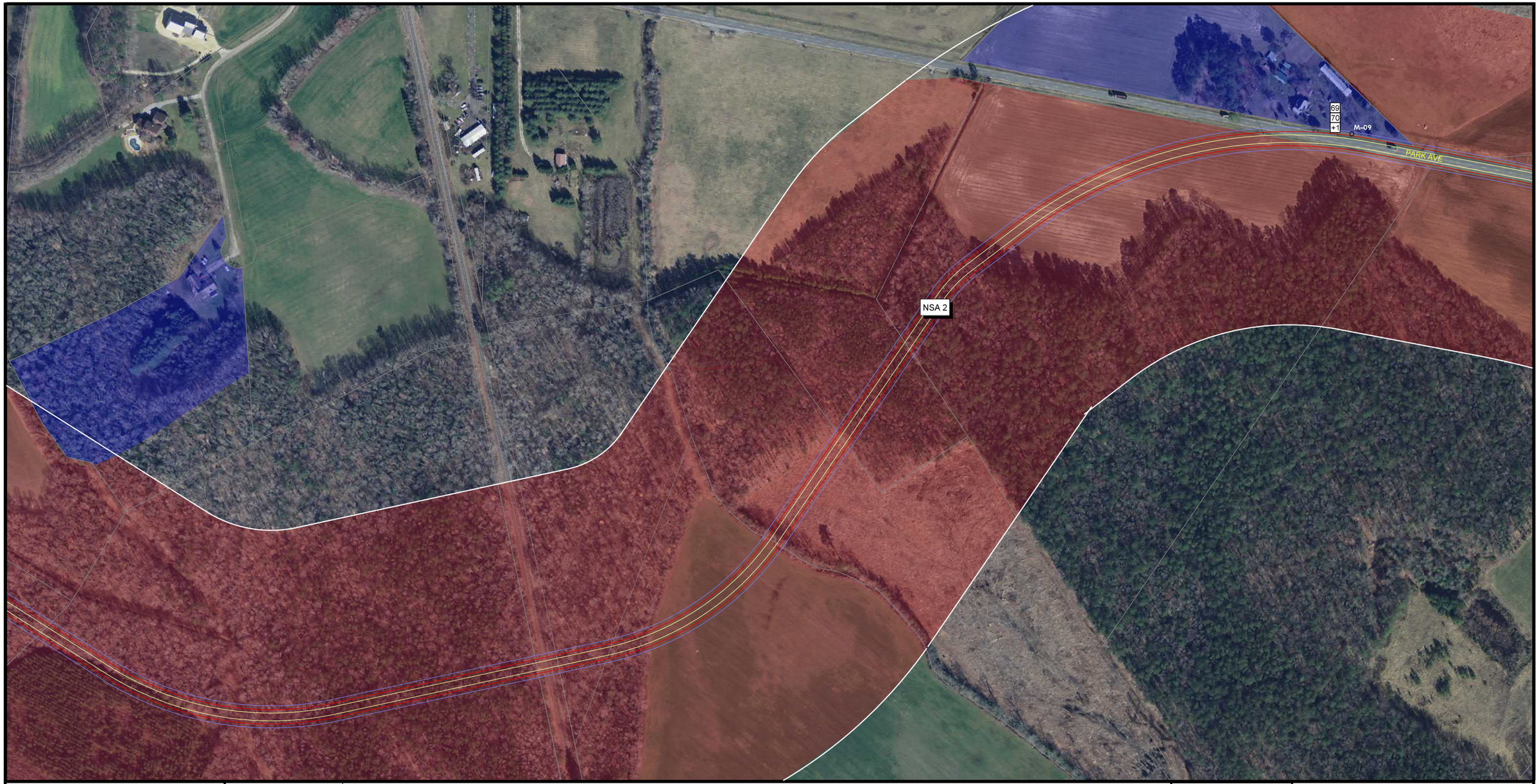
# Land Uses

Color Table and Feature Table:
Date and Time:
Filename and Model Name:

Figure 3.1, Tile 1




0 300
Scale in Feet

**Legend**

- Land Use Activity Category A Noise Sensitive Area (EXTERIOR)
- Land Use Activity Category B Noise Sensitive Area (EXTERIOR)
- Land Use Activity Category C Noise Sensitive Area (EXTERIOR)
- Land Use Activity Category D Noise Sensitive Area (INTERIOR)
- Land Use Activity Category E Noise Sensitive Area (EXTERIOR)
- Land Use Activity Category F Non-Noise Sensitive
- Land Use Activity Category G Non-Noise Sensitive
- M-XX ○ Field Noise Measurement Location
- 59 Measured Sound Level Leq(h) dB(A)
- 59 TNM Modeled Sound Level Leq(h) dB(A)
- 0 Difference Leq(h) dB(A)

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# Land Uses

Color Table and Feature Table:

Date and Time:

Filename and Model Name:

Figure 3.1, Tile 2


0 300
Scale in Feet

**Legend**

- Land Use Activity Category A Noise Sensitive Area (EXTERIOR)
- Land Use Activity Category B Noise Sensitive Area (EXTERIOR)
- Land Use Activity Category C Noise Sensitive Area (EXTERIOR)
- Land Use Activity Category D Noise Sensitive Area (INTERIOR)
- Land Use Activity Category E Noise Sensitive Area (EXTERIOR)
- Land Use Activity Category F Non-Noise Sensitive
- Land Use Activity Category G Non-Noise Sensitive
- M-XX ○ Field Noise Measurement Location
- 59 Measured Sound Level Leq(h) dB(A)
- 59 TNM Modeled Sound Level Leq(h) dB(A)
- 0 Difference Leq(h) dB(A)

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# Land Uses

Color Table and Feature Table:
Date and Time:
Filename and Model Name:

Figure 3.1, Tile 3


0 300
Scale in Feet

**Legend**

- Land Use Activity Category A Noise Sensitive Area (EXTERIOR)
- Land Use Activity Category B Noise Sensitive Area (EXTERIOR)
- Land Use Activity Category C Noise Sensitive Area (EXTERIOR)
- Land Use Activity Category D Noise Sensitive Area (INTERIOR)
- Land Use Activity Category E Noise Sensitive Area (EXTERIOR)
- Land Use Activity Category F Non-Noise Sensitive
- Land Use Activity Category G Non-Noise Sensitive
- M-XX ○ Field Noise Measurement Location
- 59 Measured Sound Level Leq(h) dB(A)
- 59 TNM Modeled Sound Level Leq(h) dB(A)
- 0 Difference Leq(h) dB(A)

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# Land Uses

Color Table and Feature Table:
Date and Time:
Filename and Model Name:

Figure 3.1, Tile 4


**Legend**

- Land Use Activity Category A Noise Sensitive Area (EXTERIOR)
- Land Use Activity Category B Noise Sensitive Area (EXTERIOR)
- Land Use Activity Category C Noise Sensitive Area (EXTERIOR)
- Land Use Activity Category D Noise Sensitive Area (INTERIOR)
- Land Use Activity Category E Noise Sensitive Area (EXTERIOR)
- Land Use Activity Category F Non-Noise Sensitive
- Land Use Activity Category G Non-Noise Sensitive
- M-XX ○ Field Noise Measurement Location
- 59 Measured Sound Level Leq(h) dB(A)
- 59 TNM Modeled Sound Level Leq(h) dB(A)
- 0 Difference Leq(h) dB(A)

0 300
Scale in Feet

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# Land Uses

Color Table and Feature Table:
Date and Time:
Filename and Model Name:

Figure 3.1, Tile 5


0 300
Scale in Feet

Legend

| | |
|---|---|
| M-XX ○ | Field Noise Measurement Location |
| R-XX ▲ | TNM Modeled Receptor Site |
| 59 | TNM Existing Peak Sound Level Leq(h) dB(A) |
| 59 | TNM 2040 Peak Sound Level Leq(h) dB(A) |
| 0 | Difference Leq(h) dB(A) |
| — — — | 66 dB(A) Noise Level Contour |

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# TNM Model Validation

Color Table and Feature Table:
Date and Time:
Filename and Model Name:

Figure 3.2, Tile 1


0 300
Scale in Feet

Legend

| | | |
|---|---|---|
| M-XX | ○ | Field Noise Measurement Location |
| R-XX | ▲ | TNM Modeled Receptor Site |
| 59 | | TNM Existing Peak Sound Level Leq(h) dB(A) |
| 59 | | TNM 2040 Peak Sound Level Leq(h) dB(A) |
| 0 | | Difference Leq(h) dB(A) |
| — — — | | 66 dB(A) Noise Level Contour |

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# TNM Model Validation

Color Table and Feature Table:
Date and Time:
Filename and Model Name:

Figure 3.2, Tile 2


0 300
Scale in Feet

Legend

| | |
|---|---|
| M-XX ○ | Field Noise Measurement Location |
| R-XX ▲ | TNM Modeled Receptor Site |
| 59 | TNM Existing Peak Sound Level Leq(h) dB(A) |
| 59 | TNM 2040 Peak Sound Level Leq(h) dB(A) |
| 0 | Difference Leq(h) dB(A) |
| — — — | 66 dB(A) Noise Level Contour |

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# TNM Model Validation

Color Table and Feature Table:
Date and Time:
Filename and Model Name:

Figure 3.2, Tile 3


0 300
Scale in Feet

Legend

| | |
|---|---|
| M-XX ○ | Field Noise Measurement Location |
| R-XX ▲ | TNM Modeled Receptor Site |
| 59 | TNM Existing Peak Sound Level Leq(h) dB(A) |
| 59 | TNM 2040 Peak Sound Level Leq(h) dB(A) |
| 0 | Difference Leq(h) dB(A) |
| — — — | 66 dB(A) Noise Level Contour |

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# TNM Model Validation

Color Table and Feature Table:
Date and Time:
Filename and Model Name:

Figure 3.2, Tile 4


0 300
Scale in Feet

Legend

| | |
|---|---|
| M-XX ○ | Field Noise Measurement Location |
| R-XX ▲ | TNM Modeled Receptor Site |
| 59 | TNM Existing Peak Sound Level Leq(h) dB(A) |
| 59 | TNM 2040 Peak Sound Level Leq(h) dB(A) |
| 0 | Difference Leq(h) dB(A) |
| — — — | 66 dB(A) Noise Level Contour |

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# TNM Model Validation

Color Table and Feature Table:
Date and Time:
Filename and Model Name:

Figure 3.2, Tile 5

# Appendix B – Sound Measurement Data

## RECEPTOR M-01 - 23424 Park Avenue

**Short-term Noise Measurement**

Start: 11:30 May 15, 2014

End: 12:00 May 15, 2014

| | | | | | | Not Despiked | | | Despiked | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Time** | **Lav dB(A)** | **Lmax dB(A)** | **Lpk dB(C)** | **L(10.0) dB(A)** | **L(99) dB(A)** | **5-min Leq dB(A)** | **30-min Leq dB(A)** | **Valid?** | **5-min Leq dB(A)** | **30-min Leq dB(A)** | **Noise Level** |
| 11:30 | 66.6 | 78.8 | <110.2 | 69 | 46 | 62.9 | 63.6 | Yes | 62.9 | 63.6 | **64** |
| 11:31 | 63.8 | 77.6 | <110.2 | 66 | 48 | | | Yes | | | |
| 11:32 | 59.5 | 70.2 | <110.2 | 63 | 49 | | | Yes | | | |
| 11:33 | 59 | 68 | 111.9 | 63 | 49 | | | Yes | | | |
| 11:34 | 60.7 | 67.6 | <110.2 | 64 | 48 | | | Yes | | | |
| 11:35 | 67.8 | 80.4 | 110.5 | 69 | 50 | 65.2 | | Yes | 65.2 | | |
| 11:36 | 63.7 | 73.4 | 114.1 | 68 | 49 | | | Yes | | | |
| 11:37 | 62.6 | 72.2 | <110.2 | 66 | 46 | | | Yes | | | |
| 11:38 | 66.9 | 79.4 | 110.5 | 69 | 48 | | | Yes | | | |
| 11:39 | 62.2 | 74.7 | <110.2 | 65 | 49 | | | Yes | | | |
| 11:40 | 63 | 71.8 | <110.2 | 66 | 51 | 63.1 | | Yes | 63.1 | | |
| 11:41 | 62.5 | 72.6 | <110.2 | 66 | 51 | | | Yes | | | |
| 11:42 | 52.9 | 59.8 | <110.2 | 54 | 49 | | | Yes | | | |
| 11:43 | 62.7 | 73.2 | <110.2 | 66 | 50 | | | Yes | | | |
| 11:44 | 66.3 | 77.5 | <110.2 | 69 | 48 | | | Yes | | | |
| 11:45 | 62.3 | 73.9 | <110.2 | 64 | 49 | 63.3 | | Yes | 63.3 | | |
| 11:46 | 63.4 | 74.1 | <110.2 | 67 | 49 | | | Yes | | | |
| 11:47 | 59.9 | 70.6 | <110.2 | 63 | 48 | | | Yes | | | |
| 11:48 | 65.6 | 76.6 | <110.2 | 69 | 51 | | | Yes | | | |
| 11:49 | 63.5 | 73.4 | <110.2 | 68 | 50 | | | Yes | | | |
| 11:50 | 65.9 | 76.6 | 111.2 | 69 | 48 | 62.0 | | Yes | 62.0 | | |
| 11:51 | 59 | 70.2 | <110.2 | 62 | 49 | | | Yes | | | |
| 11:52 | 58.2 | 66.7 | <110.2 | 62 | 47 | | | Yes | | | |
| 11:53 | 62.9 | 75 | <110.2 | 68 | 48 | | | Yes | | | |
| 11:54 | 58.5 | 67.6 | <110.2 | 64 | 46 | | | Yes | | | |
| 11:55 | 67.1 | 80.6 | <110.2 | 67 | 47 | 64.0 | | Yes | 64.0 | | |
| 11:56 | 59.9 | 70.2 | <110.2 | 64 | 48 | | | Yes | | | |
| 11:57 | 61.6 | 73.4 | 110.5 | 65 | 48 | | | Yes | | | |
| 11:58 | 59 | 68.6 | <110.2 | 62 | 47 | | | Yes | | | |
| 11:59 | 66.3 | 77.8 | <110.2 | 71 | 50 | | | Yes | | | |

NOISE MEASUREMENT DATA SHEET

DATE: 5-15-2014

EQUIPMENT : METER (Serial No.) 2 CALIBRATOR (Serial no.) 01807

CALIBRATION : START _____ dBA END _____ dBA

WEATHER DATA / NOTES: TEMP. _____ APPROX. REL. HUMIDITY _____ %

APPROX. WIND SPEED 4 mph

DIRECTION From south (may also be noted on site diagram below)

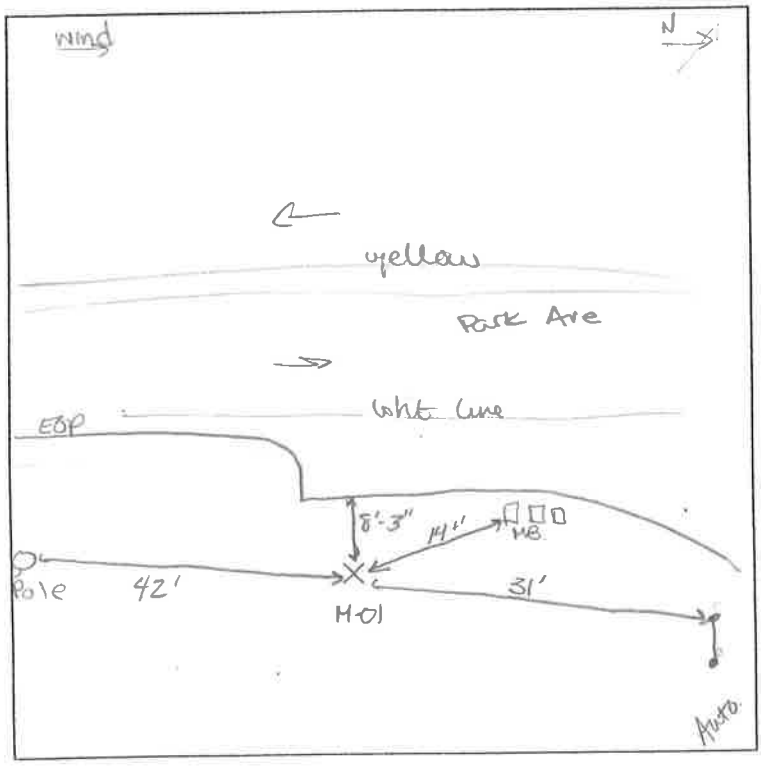
ROUTE : PARK AVE LOCATION : TMS-A M-01

COMMUNITY : PARK AVE RELOCATION START TIME: 11:10ish off 12:02

INTERVAL LENGTH : 1:00

TEST DURATION : 30min

SITE DIAGRAM




EVENTS LOG

| Time | Event |
|---|---|
| | |

TRAFFIC / OTHER NOTES : _____

## RECEPTOR M-02 - 23677 Saulsbury Lane

**Short-term Noise Measurement**

Start: 11:30 May 15, 2014

End: 12:00 May 15, 2014

| | | | | | | Not Despiked | | | Despiked | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Time** | **Lav dB(A)** | **Lmax dB(A)** | **Lpk dB(C)** | **L(10.0) dB(A)** | **L(99) dB(A)** | **5-min Leq dB(A)** | **30-min Leq dB(A)** | **Valid?** | **5-min Leq dB(A)** | **30-min Leq dB(A)** | **Noise Level** |
| 11:30 | 47.2 | 51.8 | <110.0 | 48 | 44 | 46.7 | 47.2 | Yes | 46.7 | 47.2 | **47** |
| 11:31 | 46.6 | 50.4 | <110.0 | 48 | 44 | | | Yes | | | |
| 11:32 | 46.4 | 49.2 | <110.0 | 47 | 44 | | | Yes | | | |
| 11:33 | 46.7 | 49.6 | <110.0 | 48 | 44 | | | Yes | | | |
| 11:34 | 46.8 | 50.8 | <110.0 | 48 | 44 | | | Yes | | | |
| 11:35 | 46.5 | 54.1 | <110.0 | 49 | 43 | 46.8 | | Yes | 46.8 | | |
| 11:36 | 48.1 | 52 | <110.0 | 49 | 46 | | | Yes | | | |
| 11:37 | 46.4 | 49.1 | <110.0 | 47 | 44 | | | Yes | | | |
| 11:38 | 45.7 | 48 | <110.0 | 47 | 44 | | | Yes | | | |
| 11:39 | 47.1 | 49.6 | <110.0 | 48 | 45 | | | Yes | | | |
| 11:40 | 49.6 | 53.6 | <110.0 | 51 | 46 | 48.2 | | Yes | 48.2 | | |
| 11:41 | 46.8 | 49.2 | <110.0 | 47 | 45 | | | Yes | | | |
| 11:42 | 46.6 | 47.7 | <110.0 | 47 | 45 | | | Yes | | | |
| 11:43 | 46.3 | 53.1 | <110.0 | 48 | 43 | | | Yes | | | |
| 11:44 | 50.1 | 55.8 | <110.0 | 52 | 44 | | | Yes | | | |
| 11:45 | 49.7 | 53.3 | <110.0 | 51 | 46 | 48.1 | | Yes | 48.1 | | |
| 11:46 | 47.9 | 51.5 | <110.0 | 49 | 44 | | | Yes | | | |
| 11:47 | 47 | 50 | <110.0 | 48 | 45 | | | Yes | | | |
| 11:48 | 47.2 | 50.5 | <110.0 | 49 | 45 | | | Yes | | | |
| 11:49 | 48.3 | 52.3 | <110.0 | 51 | 44 | | | Yes | | | |
| 11:50 | 46.5 | 48.7 | <110.0 | 48 | 44 | 45.7 | | Yes | 45.7 | | |
| 11:51 | 46.3 | 48.3 | <110.0 | 47 | 44 | | | Yes | | | |
| 11:52 | 45.2 | 47.7 | <110.0 | 46 | 43 | | | Yes | | | |
| 11:53 | 44.9 | 46.7 | <110.0 | 45 | 43 | | | Yes | | | |
| 11:54 | 45.1 | 47.4 | <110.0 | 46 | 43 | | | Yes | | | |
| 11:55 | 46.7 | 49 | <110.0 | 48 | 43 | 47.4 | | Yes | 47.4 | | |
| 11:56 | 48 | 50.2 | <110.0 | 49 | 45 | | | Yes | | | |
| 11:57 | 48.7 | 52 | <110.0 | 49 | 46 | | | Yes | | | |
| 11:58 | 47.2 | 48.9 | <110.0 | 48 | 45 | | | Yes | | | |
| 11:59 | 45.7 | 49.6 | <110.0 | 47 | 44 | | | Yes | | | |

pg. ____ of ____

NOISE MEASUREMENT DATA SHEET

DATE: 5-15-2014

EQUIPMENT : METER (Serial No.) 3 CALIBRATOR (Serial no.) 01807

CALIBRATION : START _____ dBA END _____ dBA

WEATHER DATA / NOTES: TEMP. _____ APPROX. REL. HUMIDITY _____ %

APPROX. WIND SPEED _____ mph

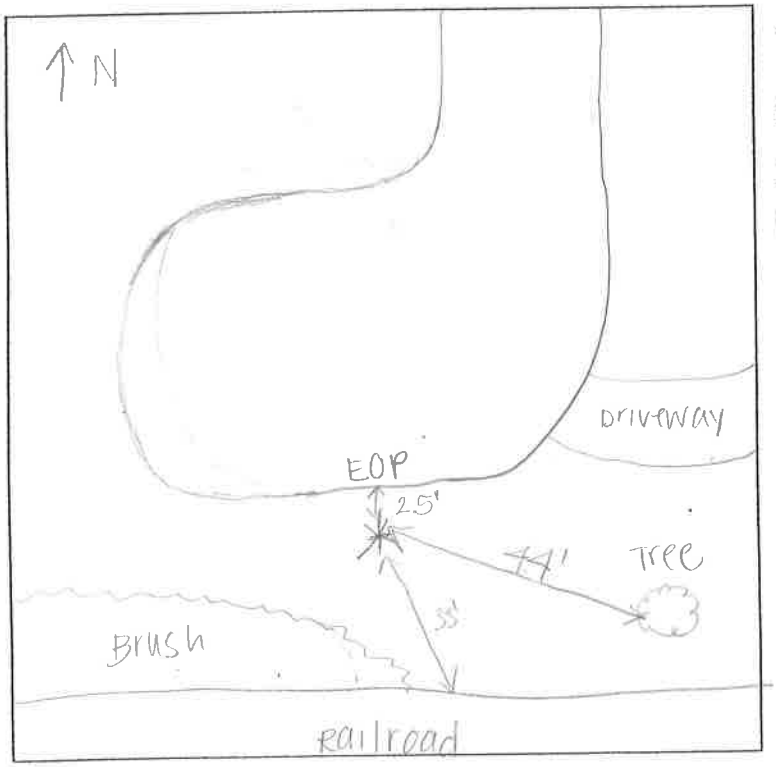
DIRECTION _____ (may also be noted on site diagram below)

ROUTE : PARK AVE LOCATION : TMS- A M-02

COMMUNITY : PARK AVE RELOCATION START TIME: _____

INTERVAL LENGTH : 1:00

SITE DIAGRAM




TEST DURATION : _____

EVENTS LOG

| Time | Event |
|---|---|
| 11:26 | Plane |

TRAFFIC / OTHER NOTES : _____

## RECEPTOR M-03 - 22319 Park Avenue

**Short-term Noise Measurement**

Start: 11:30 May 15, 2014

End: 12:00 May 15, 2014

| | | | | | | | | | Not Despiked | | | Despiked | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Leq dB(A) | Lmax dB(A) | Lmin dB(A) | L(5) dB(A) | L(10) dB(A) | L(50) dB(A) | L(90) dB(A) | L(95) dB(A) | 5-min Leq dB(A) | 30-min LeqdB(A) | Valid? | 5-min Leq dB(A) | 30-min Leq dB(A) | Noise Level |
| 11:30 | 73.1 | 85.5 | 48.7 | 79.9 | 77.0 | 59.3 | 50.0 | 49.2 | | | No | | | |
| 11:31 | 65.8 | 76.1 | 45.8 | 76.1 | 71.3 | 51.9 | 46.8 | 46.1 | | | Yes | | | |
| 11:32 | 57.9 | 69.0 | 46.7 | 67.2 | 60.6 | 50.0 | 48.3 | 48.1 | 69.6 | | Yes | 63.0 | | |
| 11:33 | 62.0 | 73.0 | 48.7 | 71.3 | 68.3 | 51.4 | 49.2 | 49.0 | | | Yes | | | |
| 11:34 | 72.8 | 87.3 | 44.1 | 77.6 | 70.8 | 51.6 | 45.4 | 44.8 | | | No | | | |
| 11:35 | 66.5 | 85.3 | 46.7 | 74.7 | 70.9 | 58.2 | 50.0 | 48.8 | | | Yes | | | |
| 11:36 | 58.4 | 66.7 | 48.5 | 63.7 | 61.8 | 56.4 | 49.7 | 48.4 | | | Yes | | | |
| 11:37 | 64.2 | 77.2 | 49.4 | 74.4 | 63.5 | 54.4 | 49.6 | 49.1 | 66.3 | | Yes | 66.3 | | |
| 11:38 | 70.1 | 82.8 | 47.2 | 78.2 | 73.9 | 54.2 | 48.0 | 47.7 | | | Yes | | | |
| 11:39 | 65.5 | 75.3 | 47.0 | 73.7 | 71.3 | 55.5 | 47.3 | 47.1 | | | Yes | | | |
| 11:40 | 69.0 | 80.4 | 45.2 | 75.7 | 75.0 | 54.4 | 46.4 | 45.3 | | | Yes | | | |
| 11:41 | 49.2 | 56.5 | 46.0 | 52.2 | 51.5 | 48.7 | 47.1 | 46.5 | | | Yes | | | |
| 11:42 | 65.4 | 77.5 | 48.1 | 72.7 | 69.5 | 53.0 | 49.5 | 48.8 | 66.2 | | Yes | 66.2 | | |
| 11:43 | 66.0 | 77.4 | 49.8 | 73.5 | 71.8 | 54.5 | 50.0 | 49.6 | | | Yes | | | |
| 11:44 | 67.3 | 77.3 | 48.0 | 76.5 | 73.4 | 55.0 | 49.7 | 47.7 | | 67.2 | Yes | | 66.1 | **66** |
| 11:45 | 69.5 | 79.9 | 48.7 | 79.9 | 74.0 | 59.1 | 50.9 | 50.2 | | | Yes | | | |
| 11:46 | 60.4 | 72.7 | 46.0 | 70.8 | 60.9 | 51.1 | 47.2 | 46.8 | | | Yes | | | |
| 11:47 | 70.2 | 81.4 | 48.7 | 76.8 | 74.9 | 55.1 | 49.9 | 48.5 | 67.4 | | Yes | 67.4 | | |
| 11:48 | 65.1 | 76.4 | 50.9 | 74.2 | 69.6 | 57.0 | 51.2 | 51.1 | | | Yes | | | |
| 11:49 | 65.6 | 79.1 | 48.9 | 74.2 | 66.5 | 52.7 | 49.4 | 48.7 | | | Yes | | | |
| 11:50 | 69.3 | 82.1 | 46.2 | 78.2 | 72.4 | 51.8 | 48.7 | 46.7 | | | Yes | | | |
| 11:51 | 64.8 | 76.3 | 46.0 | 74.6 | 70.3 | 50.9 | 47.6 | 46.9 | | | Yes | | | |
| 11:52 | 67.7 | 81.7 | 47.3 | 74.9 | 70.0 | 51.4 | 48.2 | 47.2 | 66.0 | | Yes | 66.0 | | |
| 11:53 | 63.6 | 72.6 | 45.8 | 72.2 | 69.4 | 53.3 | 48.2 | 46.3 | | | Yes | | | |
| 11:54 | 55.5 | 67.7 | 46.7 | 63.3 | 55.7 | 50.1 | 47.2 | 47.0 | | | Yes | | | |
| 11:55 | 70.0 | 83.0 | 47.2 | 76.7 | 74.6 | 58.1 | 50.5 | 49.9 | | | Yes | | | |
| 11:56 | 59.7 | 72.1 | 47.1 | 66.3 | 61.5 | 53.4 | 48.4 | 48.1 | | | Yes | | | |
| 11:57 | 61.9 | 73.1 | 48.2 | 70.8 | 65.9 | 53.3 | 49.4 | 48.9 | 66.3 | | Yes | 66.3 | | |
| 11:58 | 69.0 | 79.9 | 52.5 | 78.8 | 70.9 | 57.9 | 54.3 | 53.4 | | | Yes | | | |
| 11:59 | 60.4 | 71.5 | 49.3 | 71.1 | 59.6 | 51.8 | 49.4 | 49.0 | | | Yes | | | |

pg. ____ of ____

NOISE MEASUREMENT DATA SHEET

DATE: 5-15-2014

EQUIPMENT : METER (Serial No.) 1 CALIBRATOR (Serial no.) 01807

CALIBRATION : START 93.9 dBA END _____ dBA

WEATHER DATA / NOTES: TEMP. 82 APPROX. REL. HUMIDITY 53 %

APPROX. WIND SPEED 2-5 mph GUSTS TO 13 MPH

DIRECTION _____ (may also be noted on site diagram below)

ROUTE : PARK AVE LOCATION : TMS- A M- 03 23319 PARK AVE

COMMUNITY : PARK AVE RELOCATION START TIME: 11:30-12:00

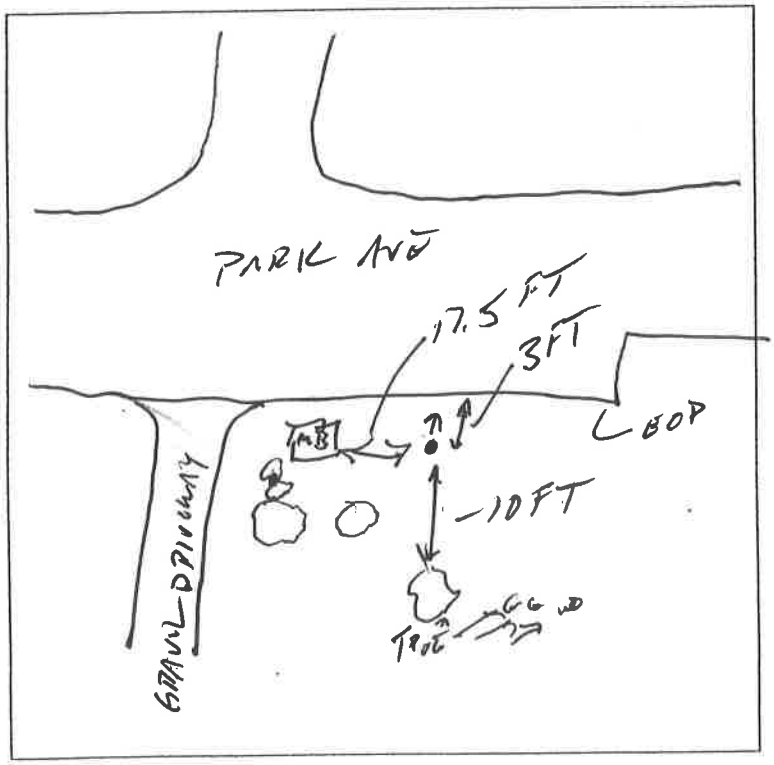
SITE DIAGRAM

INTERVAL LENGTH : 1:00

TEST DURATION : _____

EVENTS LOG

| Time | Event |
|---|---|




TRAFFIC / OTHER NOTES : _____

FREQUENT GUSTS, BUT PERIODS OF CALM AS WELL

## RECEPTOR M-04 - 22988 Park Avenue

**Short-term Noise Measurement**

Start: 12:25 May 15, 2014

End: 12:55 May 15, 2014

| | | | | | | | | | Not Despiked | | | Despiked | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Leq dB(A) | Lmax dB(A) | Lmin dB(A) | L(5) dB(A) | L(10) dB(A) | L(50) dB(A) | L(90) dB(A) | L(95) dB(A) | 5-min Leq dB(A) | 30-min LeqdB(A) | Valid? | 5-min Leq dB(A) | 30-min Leq dB(A) | Noise Level |
| 12:25 | 59.1 | 70.7 | 43.5 | 67.0 | 64.9 | 48.3 | 43.7 | 43.4 | | | Yes | | | |
| 12:26 | 62.6 | 71.2 | 47.4 | 71.2 | 69.4 | 55.1 | 48.2 | 47.6 | | | Yes | | | |
| 12:27 | 63.7 | 75.1 | 47.5 | 71.6 | 69.5 | 52.7 | 48.5 | 47.5 | 62.4 | | Yes | 62.4 | | |
| 12:28 | 64.2 | 77.2 | 41.6 | 72.7 | 66.8 | 48.0 | 42.8 | 42.1 | | | Yes | | | |
| 12:29 | 60.5 | 70.5 | 41.6 | 69.7 | 66.0 | 49.7 | 42.0 | 41.9 | | | Yes | | | |
| 12:30 | 60.1 | 69.4 | 43.2 | 68.2 | 66.1 | 52.1 | 45.8 | 44.3 | | | Yes | | | |
| 12:31 | 66.7 | 80.4 | 42.8 | 75.3 | 68.0 | 50.6 | 43.7 | 43.4 | | | Yes | | | |
| 12:32 | 64.1 | 76.9 | 44.5 | 71.3 | 68.8 | 49.3 | 45.0 | 44.5 | 62.5 | | Yes | 62.5 | | |
| 12:33 | 55.0 | 65.9 | 43.6 | 62.5 | 61.0 | 46.6 | 44.5 | 44.1 | | | Yes | | | |
| 12:34 | 55.2 | 62.8 | 43.6 | 60.7 | 59.1 | 54.1 | 44.5 | 43.8 | | | Yes | | | |
| 12:35 | **70.0** | 84.7 | 44.0 | 77.1 | 67.5 | 50.0 | 44.6 | 44.2 | | | No | | | |
| 12:36 | 67.7 | 81.5 | 45.3 | 74.3 | 67.6 | 52.1 | 46.9 | 45.9 | | | Yes | | | |
| 12:37 | 59.7 | 70.8 | 44.8 | 68.5 | 64.1 | 50.7 | 47.2 | 46.6 | 67.4 | | Yes | 64.3 | | |
| 12:38 | 61.0 | 72.7 | 45.5 | 69.6 | 60.9 | 51.4 | 46.5 | 45.6 | | | Yes | | | |
| 12:39 | **69.6** | 83.4 | 47.7 | 76.9 | 72.0 | 56.5 | 49.4 | 48.8 | | | No | | | |
| 12:40 | 65.8 | 78.2 | 48.3 | 73.6 | 69.8 | 56.9 | 50.0 | 49.9 | | 65.3 | Yes | | 64.6 | **65** |
| 12:41 | 61.9 | 70.0 | 43.7 | 68.9 | 68.4 | 56.7 | 44.9 | 44.3 | | | Yes | | | |
| 12:42 | 65.4 | 75.7 | 47.3 | 74.8 | 67.7 | 55.8 | 48.3 | 47.9 | 64.0 | | Yes | 64.0 | | |
| 12:43 | 62.0 | 73.0 | 42.9 | 69.0 | 67.4 | 53.2 | 42.9 | 42.7 | | | Yes | | | |
| 12:44 | 63.5 | 76.6 | 46.1 | 70.5 | 65.4 | 51.7 | 46.9 | 46.5 | | | Yes | | | |
| 12:45 | 60.6 | 70.9 | 41.7 | 69.1 | 66.6 | 49.1 | 42.9 | 42.1 | | | Yes | | | |
| 12:46 | 70.1 | 83.2 | 42.3 | 77.2 | 72.3 | 53.2 | 43.8 | 43.3 | | | Yes | | | |
| 12:47 | 62.2 | 73.8 | 41.7 | 69.7 | 68.3 | 50.0 | 43.5 | 43.0 | 66.0 | | Yes | 66.0 | | |
| 12:48 | 61.8 | 72.6 | 44.1 | 71.5 | 67.0 | 52.2 | 46.3 | 45.9 | | | Yes | | | |
| 12:49 | 67.2 | 79.0 | 44.4 | 76.3 | 72.0 | 51.7 | 45.0 | 44.5 | | | Yes | | | |
| 12:50 | 52.8 | 68.8 | 44.6 | 58.1 | 54.6 | 47.3 | 45.5 | 45.3 | | | Yes | | | |
| 12:51 | 69.3 | 79.6 | 47.5 | 79.0 | 72.4 | 59.8 | 47.8 | 47.6 | | | Yes | | | |
| 12:52 | 68.0 | 78.7 | 50.2 | 77.2 | 72.4 | 58.6 | 50.6 | 49.8 | 66.7 | | Yes | 66.7 | | |
| 12:53 | 68.3 | 82.7 | 44.6 | 73.1 | 70.3 | 50.2 | 45.7 | 45.3 | | | Yes | | | |
| 12:54 | 62.2 | 74.4 | 45.3 | 73.9 | 56.1 | 47.3 | 45.5 | 45.1 | | | Yes | | | |

pg. ____ of ____

NOISE MEASUREMENT DATA SHEET

DATE: 5-15-2014

EQUIPMENT : METER (Serial No.) R10N CALIBRATOR (Serial no.) 01807

CALIBRATION : START _____ dBA END _____ dBA

WEATHER DATA / NOTES: TEMP. 84 APPROX. REL. HUMIDITY 55 %

APPROX. WIND SPEED 2-5 mph OCCASIONAL GUSTS TO 12 MPH

DIRECTION _____ (may also be noted on site diagram below)

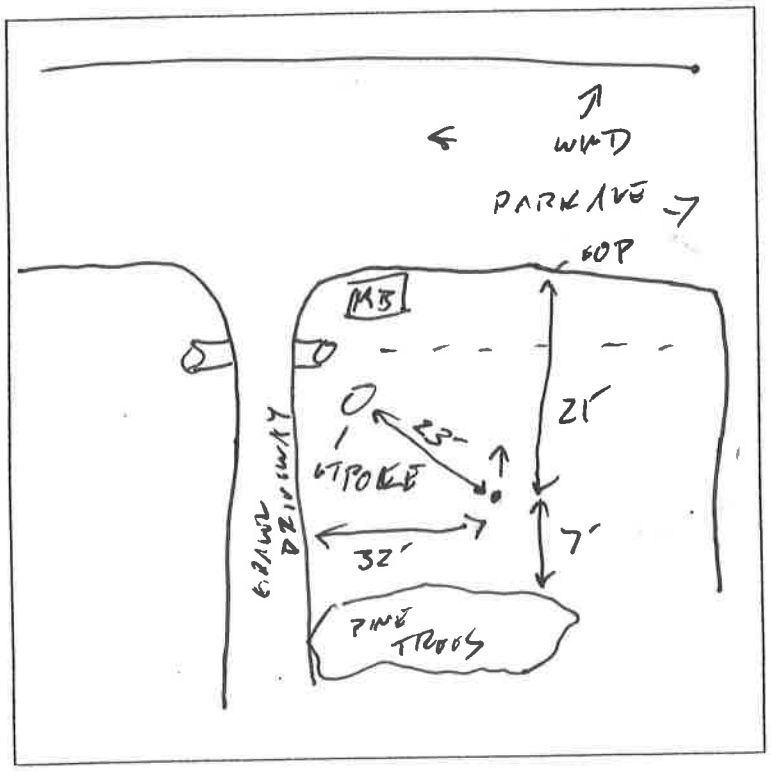
ROUTE : PARK AVE LOCATION : TMS-B M-043 22988 PARK AVE

COMMUNITY : PARK AVE RELOCATION START TIME: 12:25-12:55

INTERVAL LENGTH : 1:00

TEST DURATION : _____

SITE DIAGRAM




EVENTS LOG

| Time | Event |
|---|---|
| 12:35 | CAR STOPPED TO ASK FOR DIRECTIONS |
| 12:40 | AMBULANCE WITH HORN THROUGHOUT - GOT MOVING GRACE TWO DOORS DOWN BUT CANNOT HEAR |

TRAFFIC / OTHER NOTES : _____

23' TO UT POLE

21' TO POP

7' TO TREELINE

## RECEPTOR M-05 - 22834 Park Avenue

**Short-term Noise Measurement**

Start: 12:25 May 15, 2014

End: 12:55 May 15, 2014

| | | | | | | Not Despiked | | | Despiked | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time | Lav dB(A) | Lmax dB(A) | Lpk dB(C) | L(10.0) dB(A) | L(99) dB(A) | 5-min Leq dB(A) | 30-min Leq dB(A) | Valid? | 5-min Leq dB(A) | 30-min Leq dB(A) | Noise Level |
| 12:25 | 64.4 | 74.8 | <110.2 | 70 | 47 | 63.6 | 72.9 | Yes | 63.6 | 66.0 | **66** |
| 12:26 | 60.5 | 73 | <110.2 | 65 | 48 | | | Yes | | | |
| 12:27 | 66.2 | 77.6 | <110.2 | 70 | 50 | | | Yes | | | |
| 12:28 | 65.2 | 75.8 | <110.2 | 70 | 47 | | | Yes | | | |
| 12:29 | 50.9 | 56.6 | <110.2 | 52 | 47 | | | Yes | | | |
| 12:30 | 63.1 | 70.6 | <110.2 | 67 | 51 | 65.8 | | Yes | 65.8 | | |
| 12:31 | 70.6 | 85 | <110.2 | 70 | 49 | | | Yes | | | |
| 12:32 | 61.4 | 71.2 | <110.2 | 67 | 47 | | | Yes | | | |
| 12:33 | 65.6 | 78.6 | <110.2 | 69 | 48 | | | Yes | | | |
| 12:34 | 57.4 | 69 | <110.2 | 61 | 47 | | | Yes | | | |
| 12:35 | 67.9 | 81.8 | <110.2 | 69 | 47 | 79.9 | | Yes | 66.6 | | |
| 12:36 | 69.6 | 83.8 | <110.2 | 71 | 48 | | | Yes | | | |
| 12:37 | 56.8 | 70.8 | <110.2 | 51 | 47 | | | Yes | | | |
| 12:38 | 63.9 | 75 | <110.2 | 68 | 50 | | | Yes | | | |
| 12:39 | **86.7** | 102.8 | 118.8 | 81 | 47 | | | No | | | |
| 12:40 | 65.7 | 74.2 | <110.2 | 71 | 49 | 63.4 | | Yes | 63.4 | | |
| 12:41 | 61.8 | 71.4 | <110.2 | 67 | 46 | | | Yes | | | |
| 12:42 | 64.3 | 78.6 | <110.2 | 65 | 48 | | | Yes | | | |
| 12:43 | 63.6 | 76.1 | <110.2 | 67 | 48 | | | Yes | | | |
| 12:44 | 58.4 | 76.4 | <110.2 | 60 | 48 | | | Yes | | | |
| 12:45 | 66.7 | 79.8 | <110.2 | 70 | 49 | 66.4 | | Yes | 66.4 | | |
| 12:46 | 65 | 78.6 | <110.2 | 65 | 47 | | | Yes | | | |
| 12:47 | 62.8 | 74.9 | <110.2 | 68 | 48 | | | Yes | | | |
| 12:48 | 58.6 | 69.6 | <110.2 | 63 | 46 | | | Yes | | | |
| 12:49 | 70.5 | 83.5 | <110.2 | 73 | 47 | | | Yes | | | |
| 12:50 | 61.2 | 72.2 | <110.2 | 65 | 46 | 68.3 | | Yes | 68.3 | | |
| 12:51 | 71 | 82.6 | <110.2 | 75 | 48 | | | Yes | | | |
| 12:52 | 68.3 | 80.2 | <110.2 | 72 | 51 | | | Yes | | | |
| 12:53 | 70.5 | 84.8 | <110.2 | 72 | 48 | | | Yes | | | |
| 12:54 | 62.3 | 73.5 | <110.2 | 67 | 46 | | | Yes | | | |

NOISE MEASUREMENT DATA SHEET

DATE: 5-15-2014

EQUIPMENT : METER (Serial No.) 2 CALIBRATOR (Serial no.) 01807

CALIBRATION : START _____ dBA END _____ dBA

WEATHER DATA / NOTES: TEMP. _____ APPROX. REL. HUMIDITY _____ %

APPROX. WIND SPEED _____ mph

DIRECTION _____ (may also be noted on site diagram below)

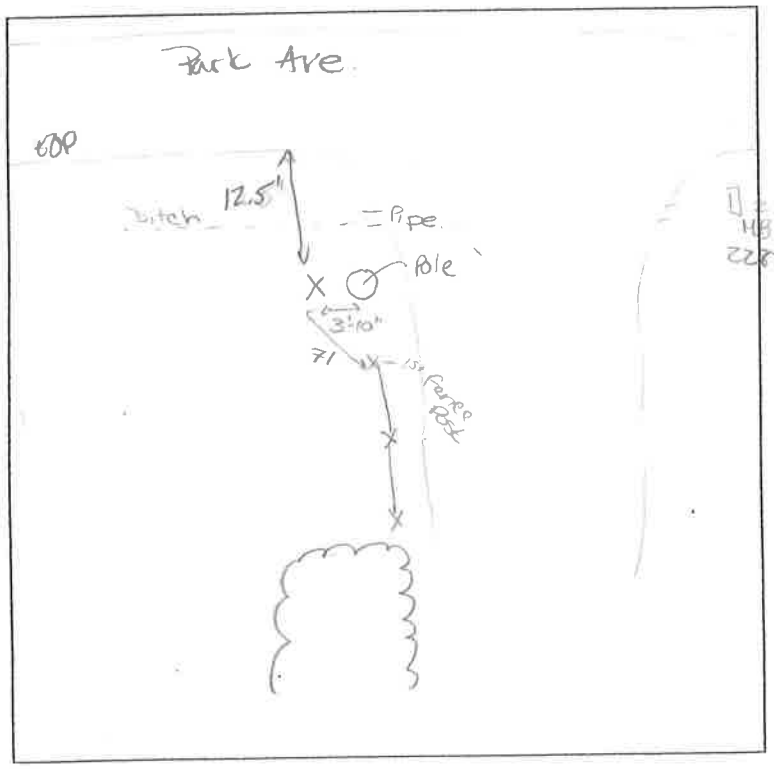
ROUTE : PARK AVE LOCATION : TMS-B M-05

COMMUNITY : PARK AVE RELOCATION START TIME: 12:19 off 12:57

INTERVAL LENGTH : 1:00

TEST DURATION : 30 min

SITE DIAGRAM




EVENTS LOG

| Time | Event |
|---|---|
| 12:40 | Emergency vehicle horn |

TRAFFIC / OTHER NOTES : _____

## RECEPTOR M-06 - 22700 Park Avenue

**Short-term Noise Measurement**

Start: 12:25 May 15, 2014
End: 12:55 May 15, 2014

| Time | Lav dB(A) | Lmax dB(A) | Lpk dB(C) | L(10.0) dB(A) | L(99) dB(A) |
|---|---|---|---|---|---|
| 12:25 | 68.7 | 78.0 | <110.0 | 73.0 | 54.0 |
| 12:26 | 65.1 | 74.8 | <110.0 | 69.0 | 50.0 |
| 12:27 | 69.5 | 78.4 | 111.7 | 75.0 | 53.0 |
| 12:28 | 66.3 | 73.6 | <110.0 | 69.0 | 54.0 |
| 12:29 | 65.8 | 76.0 | <110.0 | 68.0 | 50.0 |
| 12:30 | 64.0 | 73.1 | <110.0 | 68.0 | 48.0 |
| 12:31 | 71.7 | 86.6 | 112.6 | 72.0 | 49.0 |
| 12:32 | 64.4 | 74.0 | <110.0 | 70.0 | 48.0 |
| 12:33 | 65.7 | 76.2 | <110.0 | 71.0 | 48.0 |
| 12:34 | 67.1 | 73.8 | <110.0 | 71.0 | 57.0 |
| 12:35 | 74.7 | 88.9 | <110.0 | 75.0 | 53.0 |
| 12:36 | 69.6 | 82.4 | <110.0 | 73.0 | 49.0 |
| 12:37 | 69.4 | 84.0 | <110.0 | 70.0 | 50.0 |
| 12:38 | 66.3 | 76.4 | <110.0 | 71.0 | 49.0 |
| 12:39 | 73.7 | 89.6 | 110.0 | 73.0 | 48.0 |
| 12:40 | 69.5 | 80.0 | <110.0 | 73.0 | 51.0 |
| 12:41 | 68.8 | 78.0 | <110.0 | 72.0 | 56.0 |
| 12:42 | 68.6 | 80.6 | <110.0 | 72.0 | 54.0 |
| 12:43 | 66.0 | 78.2 | <110.0 | 67.0 | 52.0 |
| 12:44 | 67.3 | 74.9 | <110.0 | 71.0 | 50.0 |

NOISE MEASUREMENT DATA SHEET

DATE: 5-15-2014

EQUIPMENT : METER (Serial No.) 3 CALIBRATOR (Serial no.) 01807

CALIBRATION : START _____ dBA END _____ dBA

WEATHER DATA / NOTES: TEMP. _____ APPROX. REL. HUMIDITY _____ %

APPROX. WIND SPEED _____ mph

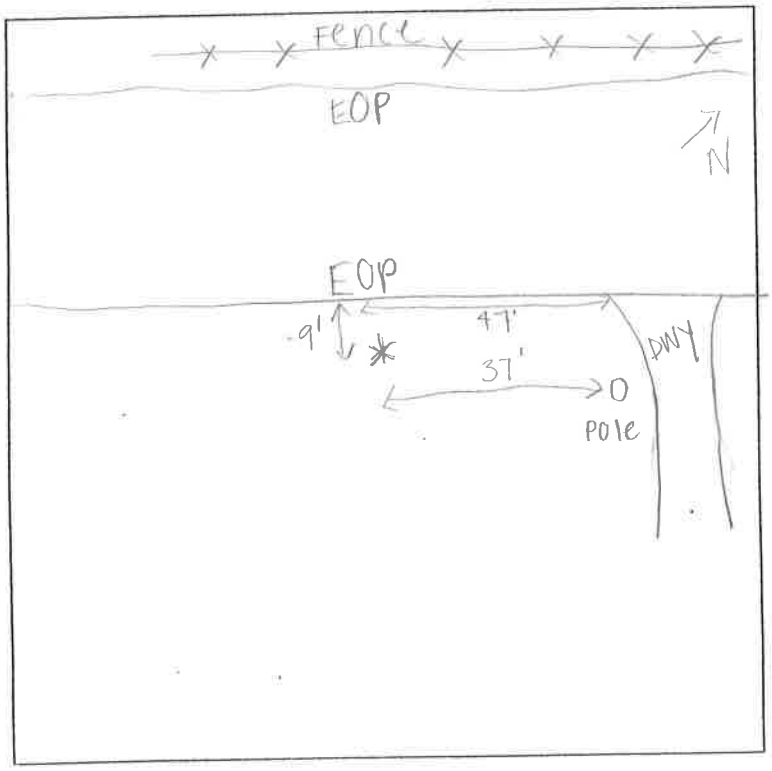
DIRECTION _____ (may also be noted on site diagram below)

ROUTE : PARK AVE LOCATION : TMS- B M- 010

COMMUNITY : PARK AVE RELOCATION START TIME: _____

INTERVAL LENGTH : 1:00

SITE DIAGRAM




TEST DURATION : _____

EVENTS LOG

| Time | Event |
|---|---|

TRAFFIC / OTHER NOTES : _____

## RECEPTOR M-07 - 22373 Park Avenue

**Short-term Noise Measurement**

Start: 14:20 May 15, 2014

End: 14:50 May 15, 2014

| | | | | | | Not Despiked | | | Despiked | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time | Lav dB(A) | Lmax dB(A) | Lpk dB(C) | L(10.0) dB(A) | L(99) dB(A) | 5-min Leq dB(A) | 30-min Leq dB(A) | Valid? | 5-min Leq dB(A) | 30-min Leq dB(A) | Noise Level |
| 14:20 | 65.5 | 75.4 | <110.0 | 71 | 47 | 76.4 | 73.0 | Yes | 71.2 | 71.0 | **71** |
| 14:21 | 71.3 | 84 | <110.0 | 74 | 47 | | | Yes | | | |
| 14:22 | **80.1** | 98.3 | 129.5 | 74 | 48 | | | No | | | |
| 14:23 | **78.7** | 93.2 | 111.7 | 83 | 48 | | | No | | | |
| 14:24 | 73.6 | 85 | <110.0 | 76 | 50 | | | Yes | | | |
| 14:25 | 69.6 | 81.8 | <110.0 | 74 | 47 | 72.0 | | Yes | 69.2 | | |
| 14:26 | **76.6** | 91.7 | 120.4 | 75 | 46 | | | No | | | |
| 14:27 | 66.6 | 75.9 | <110.0 | 71 | 45 | | | Yes | | | |
| 14:28 | 72.2 | 82 | <110.0 | 77 | 48 | | | Yes | | | |
| 14:29 | 64.7 | 76.4 | <110.0 | 69 | 50 | | | Yes | | | |
| 14:30 | 71.5 | 84.2 | <110.0 | 75 | 46 | 72.3 | | Yes | 72.3 | | |
| 14:31 | 72.7 | 83.6 | 115.6 | 77 | 47 | | | Yes | | | |
| 14:32 | 73.4 | 86.2 | 116.4 | 78 | 51 | | | Yes | | | |
| 14:33 | 68.9 | 82.5 | <110.0 | 71 | 49 | | | Yes | | | |
| 14:34 | 73.7 | 83.6 | <110.0 | 78 | 50 | | | Yes | | | |
| 14:35 | 67.6 | 80.8 | <110.0 | 71 | 47 | 71.8 | | Yes | 69.6 | | |
| 14:36 | **75.9** | 89.6 | 116.4 | 79 | 52 | | | No | | | |
| 14:37 | 70.8 | 80 | <110.0 | 76 | 50 | | | Yes | | | |
| 14:38 | 69.7 | 80 | <110.0 | 74 | 49 | | | Yes | | | |
| 14:39 | 69.8 | 80.3 | <110.0 | 74 | 47 | | | Yes | | | |
| 14:40 | 72.1 | 84.2 | 115.6 | 78 | 49 | 72.6 | | Yes | 72.6 | | |
| 14:41 | 73.9 | 86.6 | 111.4 | 76 | 50 | | | Yes | | | |
| 14:42 | 73.6 | 87.6 | 114.8 | 77 | 44 | | | Yes | | | |
| 14:43 | 69.5 | 79.2 | <110.0 | 74 | 45 | | | Yes | | | |
| 14:44 | 72.8 | 83.4 | <110.0 | 78 | 49 | | | Yes | | | |
| 14:45 | 68.6 | 79.1 | <110.0 | 73 | 45 | 69.7 | | Yes | 69.7 | | |
| 14:46 | 73.5 | 88.2 | <110.0 | 74 | 46 | | | Yes | | | |
| 14:47 | 65.3 | 77.2 | <110.0 | 69 | 45 | | | Yes | | | |
| 14:48 | 69.6 | 82.7 | <110.0 | 73 | 46 | | | Yes | | | |
| 14:49 | 66.4 | 78.3 | <110.0 | 71 | 44 | | | Yes | | | |

pg. ____ of ____

NOISE MEASUREMENT DATA SHEET

DATE: 5-15-2014

EQUIPMENT : METER (Serial No.) 3 CALIBRATOR (Serial no.) 01807

CALIBRATION : START _____ dBA END _____ dBA

WEATHER DATA / NOTES: TEMP. _____ APPROX. REL. HUMIDITY _____ %

APPROX. WIND SPEED _____ mph

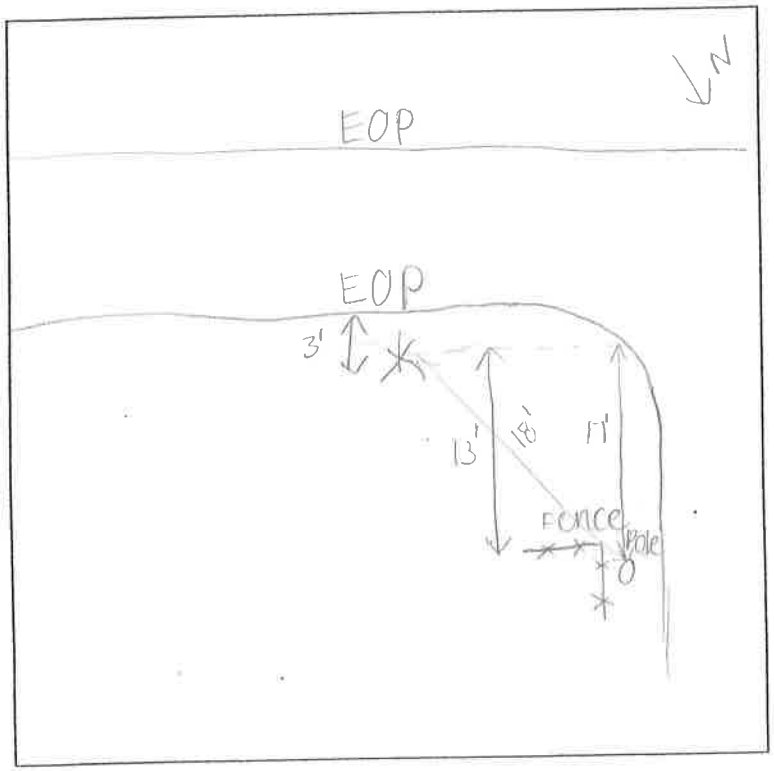
DIRECTION _____ (may also be noted on site diagram below)

ROUTE : PARK AVE LOCATION : TMS- C M- 07

COMMUNITY : PARK AVE RELOCATION START TIME: _____

INTERVAL LENGTH : 1:00

SITE DIAGRAM




TEST DURATION : _____

EVENTS LOG

| Time | Event |
|---|---|
| 2:38 | Plane |

TRAFFIC / OTHER NOTES : _____

## RECEPTOR M-08 - Wood Branch Rd/Cedar lane

**Short-term Noise Measurement**

Start: 14:20 May 15, 2014

End: 14:50 May 15, 2014

| | | | | | | Not Despiked | | | Despiked | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time | Lav dB(A) | Lmax dB(A) | Lpk dB(C) | L(10.0) dB(A) | L(99) dB(A) | 5-min Leq dB(A) | 30-min Leq dB(A) | Valid? | 5-min Leq dB(A) | 30-min Leq dB(A) | Noise Level |
| 14:20 | 47.4 | 53.2 | <110.2 | 49 | 45 | 56.8 | 61.5 | Yes | 53.6 | 55.3 | 55 |
| 14:21 | 52.5 | 62.2 | <110.2 | 55 | 45 | | | Yes | | | |
| 14:22 | 61.6 | 70.8 | <110.2 | 66 | 49 | | | No | | | |
| 14:23 | 54.5 | 63.2 | <110.2 | 57 | 47 | | | Yes | | | |
| 14:24 | 56.1 | 62.7 | <110.2 | 60 | 47 | | | Yes | | | |
| 14:25 | 54 | 61.8 | <110.2 | 59 | 46 | 52.6 | | Yes | 52.6 | | |
| 14:26 | 51.5 | 58.1 | <110.2 | 54 | 44 | | | Yes | | | |
| 14:27 | 52.2 | 59 | <110.2 | 56 | 45 | | | Yes | | | |
| 14:28 | 53.9 | 61.4 | <110.2 | 58 | 45 | | | Yes | | | |
| 14:29 | 50.4 | 56.8 | <110.2 | 53 | 44 | | | Yes | | | |
| 14:30 | 55.6 | 64.8 | <110.2 | 60 | 45 | 62.0 | | Yes | 54.3 | | |
| 14:31 | 68.4 | 80.5 | <110.2 | 72 | 49 | | | No | | | |
| 14:32 | 55.5 | 65.4 | <110.2 | 58 | 46 | | | Yes | | | |
| 14:33 | 47.4 | 53.8 | <110.2 | 48 | 45 | | | Yes | | | |
| 14:34 | 54.8 | 60.3 | <110.2 | 58 | 47 | | | Yes | | | |
| 14:35 | 58 | 65.1 | <110.2 | 62 | 47 | 66.8 | | Yes | 56.8 | | |
| 14:36 | 69.8 | 82.2 | <110.2 | 73 | 46 | | | No | | | |
| 14:37 | 50.3 | 59 | <110.2 | 52 | 45 | | | Yes | | | |
| 14:38 | 58.4 | 67.8 | <110.2 | 62 | 47 | | | Yes | | | |
| 14:39 | 71.1 | 83.1 | <110.2 | 75 | 46 | | | No | | | |
| 14:40 | 56 | 65.8 | <110.2 | 60 | 46 | 59.7 | | Yes | 56.0 | | |
| 14:41 | 64.8 | 76.6 | <110.2 | 69 | 47 | | | No | | | |
| 14:42 | 54.7 | 62.6 | <110.2 | 60 | 46 | | | Yes | | | |
| 14:43 | 57.3 | 65.5 | <110.2 | 62 | 46 | | | Yes | | | |
| 14:44 | 55.7 | 67 | <110.2 | 59 | 46 | | | Yes | | | |
| 14:45 | 57.4 | 68.8 | <110.2 | 58 | 45 | 56.9 | | Yes | 56.9 | | |
| 14:46 | 56 | 63.4 | <110.2 | 60 | 46 | | | Yes | | | |
| 14:47 | 51.5 | 61.8 | <110.2 | 52 | 45 | | | Yes | | | |
| 14:48 | 60.2 | 70.2 | <110.2 | 65 | 48 | | | Yes | | | |
| 14:49 | 55.1 | 60.2 | <110.2 | 59 | 48 | | | Yes | | | |

NOISE MEASUREMENT DATA SHEET

DATE: 5-15-2014

EQUIPMENT : METER (Serial No.) 2 CALIBRATOR (Serial no.) 01807

CALIBRATION : START _____ dBA END _____ dBA

WEATHER DATA / NOTES: TEMP. _____ APPROX. REL. HUMIDITY _____ %

APPROX. WIND SPEED _____ mph

DIRECTION _____ (may also be noted on site diagram below)

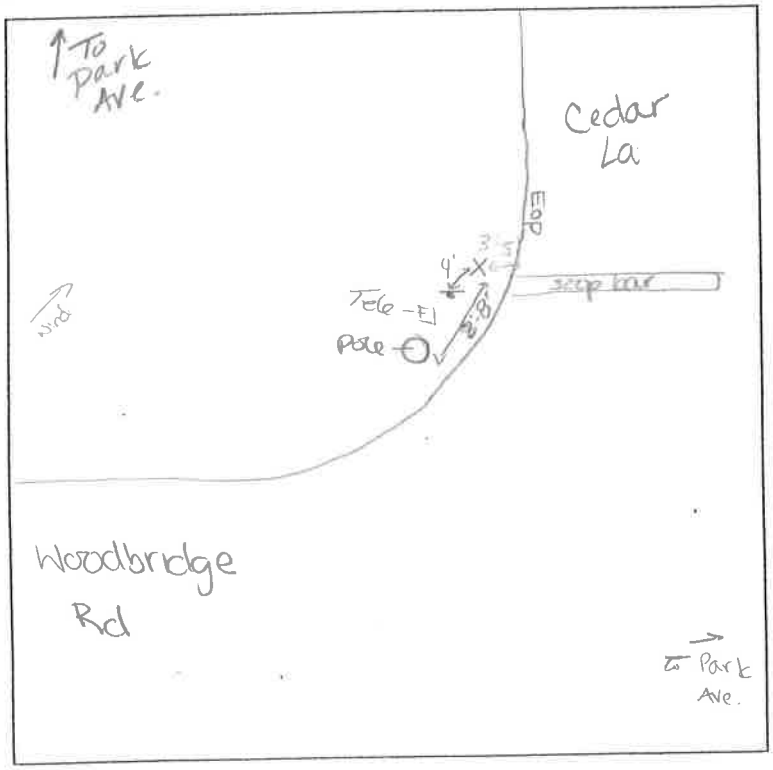
ROUTE : PARK AVE LOCATION : TMS-C M-08

COMMUNITY : PARK AVE RELOCATION START TIME: _____

INTERVAL LENGTH : 1:00

TEST DURATION : _____

SITE DIAGRAM




EVENTS LOG

| Time | Event |
|---|---|
| 2:38. | Take-off. |

TRAFFIC / OTHER NOTES : _____

## RECEPTOR M-09 - 22181 Park Avenue

**Short-term Noise Measurement**

Start: 14:20 May 15, 2014

End: 14:50 May 15, 2014

| | | | | | | | | | Not Despiked | | | Despiked | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Leq dB(A) | Lmax dB(A) | Lmin dB(A) | L(5) dB(A) | L(10) dB(A) | L(50) dB(A) | L(90) dB(A) | L(95) dB(A) | 5-min Leq dB(A) | 30-min LeqdB(A) | Valid? | 5-min Leq dB(A) | 30-min Leq dB(A) | Noise Level |
| 14:20 | 68.4 | 79.5 | 42.0 | 75.8 | 72.0 | 57.5 | 44.1 | 43.0 | | | Yes | | | |
| 14:21 | 68.7 | 81.7 | 42.2 | 76.7 | 73.3 | 54.1 | 45.3 | 44.5 | | | Yes | | | |
| 14:22 | 67.9 | 80.1 | 46.6 | 74.1 | 72.8 | 57.6 | 47.6 | 46.8 | 68.4 | | Yes | 68.4 | | |
| 14:23 | 71.1 | 83.0 | 47.6 | 78.8 | 74.9 | 63.8 | 49.4 | 48.8 | | | Yes | | | |
| 14:24 | 62.0 | 71.1 | 49.3 | 70.1 | 68.4 | 56.9 | 51.0 | 49.5 | | | Yes | | | |
| 14:25 | 68.9 | 82.5 | 48.4 | 76.4 | 71.0 | 54.9 | 49.6 | 49.2 | | | Yes | | | |
| 14:26 | 64.1 | 74.7 | 46.0 | 71.9 | 69.9 | 54.7 | 46.9 | 46.5 | | | Yes | | | |
| 14:27 | 71.3 | 82.5 | 48.5 | 80.3 | 75.2 | 59.6 | 51.6 | 49.4 | 69.4 | | Yes | 69.4 | | |
| 14:28 | 67.7 | 78.5 | 47.3 | 76.7 | 74.2 | 53.8 | 48.3 | 47.8 | | | Yes | | | |
| 14:29 | 71.3 | 84.1 | 50.0 | 80.0 | 74.5 | 56.6 | 51.9 | 51.1 | | | Yes | | | |
| 14:30 | 70.1 | 83.7 | 49.1 | 74.5 | 73.0 | 56.6 | 50.2 | 49.4 | | | Yes | | | |
| 14:31 | 66.8 | 76.4 | 49.9 | 75.7 | 72.7 | 57.5 | 50.7 | 50.0 | | | Yes | | | |
| 14:32 | 67.7 | 79.3 | 48.7 | 76.1 | 73.0 | 55.3 | 50.0 | 48.9 | 70.5 | | Yes | 68.9 | | |
| 14:33 | 74.0 | 86.8 | 53.0 | 80.3 | 77.3 | 64.6 | 55.8 | 54.1 | | | No | | | |
| 14:34 | 70.1 | 79.5 | 51.8 | 77.4 | 74.2 | 60.5 | 52.8 | 52.4 | | | Yes | | | |
| 14:35 | 68.0 | 77.9 | 46.9 | 77.7 | 74.2 | 55.3 | 47.4 | 47.3 | | 69.7 | Yes | | 68.9 | **69** |
| 14:36 | 71.5 | 86.1 | 48.2 | 76.2 | 73.8 | 55.8 | 48.7 | 48.3 | | | Yes | | | |
| 14:37 | 71.4 | 81.1 | 50.7 | 79.7 | 76.8 | 60.5 | 51.4 | 51.0 | 69.7 | | Yes | 69.7 | | |
| 14:38 | 68.4 | 78.0 | 46.7 | 75.7 | 75.2 | 60.5 | 47.9 | 47.8 | | | Yes | | | |
| 14:39 | 67.6 | 78.0 | 46.0 | 77.3 | 73.3 | 56.7 | 47.1 | 46.4 | | | Yes | | | |
| 14:40 | 64.8 | 78.7 | 47.1 | 70.3 | 66.2 | 51.4 | 48.1 | 47.7 | | | Yes | | | |
| 14:41 | 75.5 | 85.5 | 54.7 | 83.5 | 80.6 | 69.2 | 57.1 | 56.2 | | | No | | | |
| 14:42 | 70.2 | 82.8 | 49.0 | 77.0 | 74.3 | 60.9 | 49.8 | 49.5 | 71.2 | | Yes | 68.7 | | |
| 14:43 | 70.8 | 82.4 | 51.6 | 77.2 | 74.6 | 60.5 | 53.0 | 51.5 | | | Yes | | | |
| 14:44 | 66.2 | 75.0 | 46.0 | 74.4 | 72.6 | 52.6 | 46.8 | 46.3 | | | Yes | | | |
| 14:45 | 68.0 | 78.8 | 44.0 | 76.8 | 74.6 | 53.9 | 44.7 | 44.7 | | | Yes | | | |
| 14:46 | 62.3 | 74.0 | 44.7 | 70.5 | 65.0 | 49.0 | 45.9 | 45.2 | | | Yes | | | |
| 14:47 | 69.1 | 82.5 | 47.3 | 73.9 | 71.7 | 57.8 | 49.6 | 47.9 | 67.8 | | Yes | 67.8 | | |
| 14:48 | 70.7 | 79.5 | 50.0 | 78.4 | 77.1 | 63.7 | 52.9 | 50.4 | | | Yes | | | |
| 14:49 | 64.0 | 74.7 | 45.3 | 73.7 | 70.0 | 51.6 | 47.9 | 46.1 | | | Yes | | | |

pg. ____ of ____

NOISE MEASUREMENT DATA SHEET

DATE: 5-15-2014

EQUIPMENT : METER (Serial No.) R10N CALIBRATOR (Serial no.) 01807

CALIBRATION : START _____ dBA END _____ dBA

WEATHER DATA / NOTES: TEMP. 83 APPROX. REL. HUMIDITY 57 %

APPROX. WIND SPEED 4-9 mph

DIRECTION _____ (may also be noted on site diagram below)

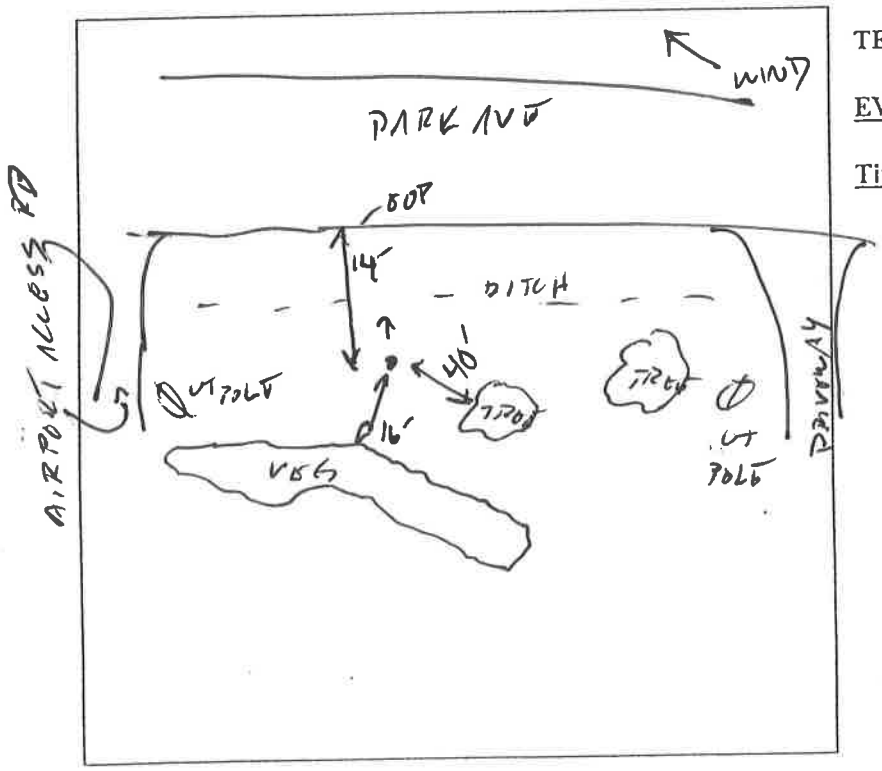
ROUTE : PARK AVE LOCATION : TMS- C M-69C

COMMUNITY : PARK AVE RELOCATION START TIME: 2:20-2:50

INTERVAL LENGTH : 1:00

TEST DURATION : _____

SITE DIAGRAM




EVENTS LOG

| Time | Event |
|---|---|
| 2:36 | AIRPLANE HIGH OVERHEAD, COULD BARELY HEAR |
| 2:38 | VERY SMALL PROP PLANE TOOK OFF FROM SHORT RUNWAY (PARALLEL TO PARK AVE) |

TRAFFIC / OTHER NOTES : _____

HIGH NUMBER OF EMPT & SCHOOL BUSES WB

_____

_____

# RECEPTOR M-10 - 437 Bedford Street

**Short-term Noise Measurement**

Start: 15:05 May 15, 2014

End: 15:35 May 15, 2014

| | | | | | | Not Despiked | | | Despiked | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time | Lav dB(A) | Lmax dB(A) | Lpk dB(C) | L(10.0) dB(A) | L(99) dB(A) | 5-min Leq dB(A) | 30-min Leq dB(A) | Valid? | 5-min Leq dB(A) | 30-min Leq dB(A) | Noise Level |
| 15:05 | 65.1 | 71.9 | <110.2 | 69 | 50 | 69.2 | 80.0 | Yes | 68.0 | 69.4 | 69 |
| 15:06 | 68 | 74.2 | <110.2 | 71 | 55 | | | Yes | | | |
| 15:07 | 66.9 | 76.1 | <110.2 | 71 | 53 | | | Yes | | | |
| 15:08 | 70.3 | 78.9 | <110.2 | 75 | 56 | | | Yes | | | |
| 15:09 | 72.2 | 78.4 | <110.2 | 75 | 59 | | | No | | | |
| 15:10 | 69.7 | 75.4 | <110.2 | 73 | 58 | 71.6 | | Yes | 69.8 | | |
| 15:11 | 75.3 | 87.8 | <110.2 | 77 | 57 | | | No | | | |
| 15:12 | 66.4 | 75.3 | <110.2 | 70 | 52 | | | Yes | | | |
| 15:13 | 69.9 | 76.6 | <110.2 | 73 | 54 | | | Yes | | | |
| 15:14 | 71.6 | 79.8 | <110.2 | 75 | 56 | | | Yes | | | |
| 15:15 | 68 | 75.3 | <110.2 | 72 | 50 | 67.4 | | Yes | 67.4 | | |
| 15:16 | 67 | 75.6 | <110.2 | 72 | 51 | | | Yes | | | |
| 15:17 | 68.7 | 78.9 | <110.2 | 72 | 52 | | | Yes | | | |
| 15:18 | 66 | 72.9 | <110.2 | 71 | 49 | | | Yes | | | |
| 15:19 | 66.6 | 73.5 | <110.2 | 70 | 50 | | | Yes | | | |
| 15:20 | 69.9 | 78.1 | <110.2 | 73 | 60 | 71.4 | | Yes | 69.9 | | |
| 15:21 | 74.6 | 85.9 | <110.2 | 76 | 64 | | | No | | | |
| 15:22 | 69.5 | 75 | <110.2 | 73 | 55 | | | Yes | | | |
| 15:23 | 70.5 | 78.9 | <110.2 | 73 | 55 | | | Yes | | | |
| 15:24 | 69.8 | 77.6 | <110.2 | 72 | 56 | | | Yes | | | |
| 15:25 | 71.2 | 78.7 | 114.1 | 74 | 55 | 69.9 | | Yes | 69.9 | | |
| 15:26 | 64.6 | 73.2 | 110.5 | 68 | 51 | | | Yes | | | |
| 15:27 | 71.2 | 80.2 | 113 | 75 | 52 | | | Yes | | | |
| 15:28 | 69.8 | 77.2 | 112.2 | 73 | 56 | | | Yes | | | |
| 15:29 | 70.2 | 78.2 | <110.2 | 73 | 57 | | | Yes | | | |
| 15:30 | 68.7 | 76.3 | <110.2 | 72 | 58 | 87.4 | | Yes | 70.7 | | |
| 15:31 | 71.7 | 81.2 | <110.2 | 75 | 57 | | | Yes | | | |
| 15:32 | 71.3 | 76.8 | <110.2 | 74 | 58 | | | Yes | | | |
| 15:33 | 70.6 | 81.2 | <110.2 | 73 | 54 | | | Yes | | | |
| 15:34 | 94.3 | 111.9 | >142.1 | 90 | 56 | | | No | | | |

NOISE MEASUREMENT DATA SHEET

DATE: 5-15-2014

EQUIPMENT : METER (Serial No.) 2 CALIBRATOR (Serial no.) 01807

CALIBRATION : START _____ dBA END _____ dBA

WEATHER DATA / NOTES: TEMP. _____ APPROX. REL. HUMIDITY _____ %

APPROX. WIND SPEED _____ mph

DIRECTION _____ (may also be noted on site diagram below)

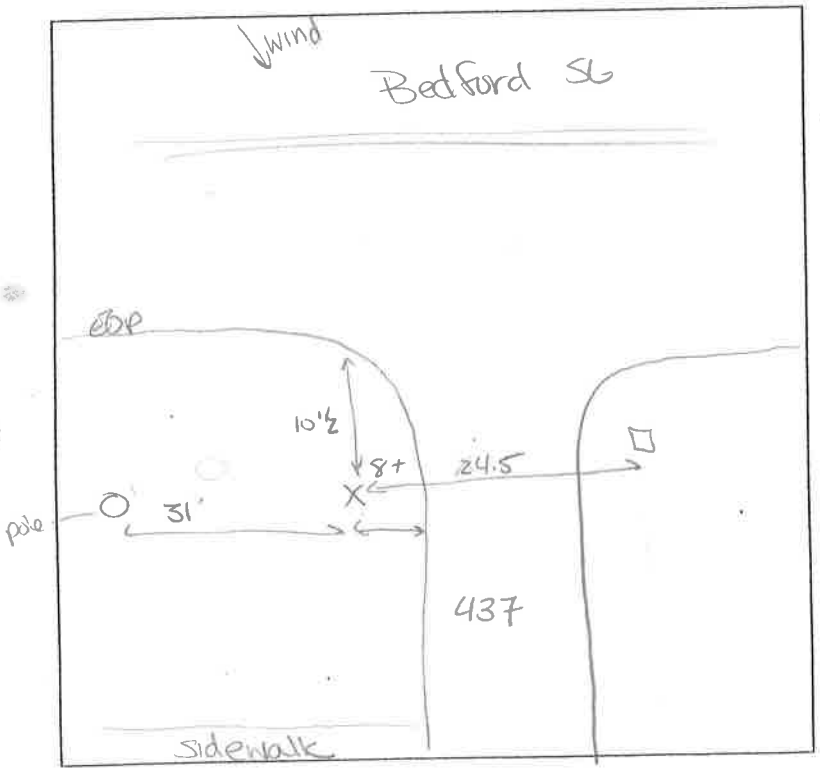
ROUTE : PARK AVE LOCATION : TMS-D M-10

COMMUNITY : PARK AVE RELOCATION START TIME: 3:04

INTERVAL LENGTH : 1:00

TEST DURATION : 30

SITE DIAGRAM




EVENTS LOG

| Time | Event |
|---|---|

TRAFFIC / OTHER NOTES : _____

## RECEPTOR M-11 - 507 Bedford Street

**Short-term Noise Measurement**

Start: 15:05 May 15, 2014

End: 15:35 May 15, 2014

| | | | | | | Not Despiked | | | Despiked | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time | Lav dB(A) | Lmax dB(A) | Lpk dB(C) | L(10.0) dB(A) | L(99) dB(A) | 5-min Leq dB(A) | 30-min Leq dB(A) | Valid? | 5-min Leq dB(A) | 30-min Leq dB(A) | Noise Level |
| 15:05 | 65.5 | 76 | <110.0 | 68 | 53 | 69.1 | 72.3 | Yes | 69.1 | 70.8 | 71 |
| 15:06 | 67.8 | 78.3 | <110.0 | 71 | 51 | | | Yes | | | |
| 15:07 | 67.8 | 78.9 | <110.0 | 71 | 51 | | | Yes | | | |
| 15:08 | 71 | 80.1 | <110.0 | 74 | 58 | | | Yes | | | |
| 15:09 | 70.9 | 78.8 | <110.0 | 74 | 52 | | | Yes | | | |
| 15:10 | 72.3 | 79.6 | <110.0 | 75 | 59 | 75.7 | | Yes | 71.6 | | |
| 15:11 | **80.6** | 95.2 | 118.5 | 78 | 56 | | | No | | | |
| 15:12 | 70.9 | 78.9 | <110.0 | 75 | 54 | | | Yes | | | |
| 15:13 | 71.5 | 78 | <110.0 | 75 | 56 | | | Yes | | | |
| 15:14 | **74.5** | 82.6 | <110.0 | 77 | 60 | | | No | | | |
| 15:15 | 70 | 77.3 | <110.0 | 73 | 53 | 70.3 | | Yes | 69.8 | | |
| 15:16 | 70.9 | 78.8 | <110.0 | 74 | 55 | | | Yes | | | |
| 15:17 | **71.6** | 80.2 | 111 | 74 | 58 | | | No | | | |
| 15:18 | 68 | 75.6 | <110.0 | 72 | 53 | | | Yes | | | |
| 15:19 | 70 | 79.6 | <110.0 | 74 | 52 | | | Yes | | | |
| 15:20 | 71.4 | 77.8 | <110.0 | 75 | 59 | 71.5 | | Yes | 71.5 | | |
| 15:21 | 72.9 | 81.5 | <110.0 | 76 | 60 | | | Yes | | | |
| 15:22 | 71 | 77.2 | <110.0 | 74 | 57 | | | Yes | | | |
| 15:23 | 68.7 | 74.8 | <110.0 | 72 | 55 | | | Yes | | | |
| 15:24 | 72.5 | 79.1 | <110.0 | 75 | 61 | | | Yes | | | |
| 15:25 | 72.7 | 78.2 | <110.0 | 75 | 55 | 72.3 | | Yes | 71.3 | | |
| 15:26 | 68.6 | 75.9 | <110.0 | 72 | 52 | | | Yes | | | |
| 15:27 | 70.8 | 80.8 | <110.0 | 75 | 53 | | | Yes | | | |
| 15:28 | **74.9** | 81.6 | <110.0 | 79 | 62 | | | No | | | |
| 15:29 | 72.1 | 78.1 | <110.0 | 75 | 57 | | | Yes | | | |
| 15:30 | 67.4 | 76.8 | <110.0 | 71 | 55 | 71.8 | | Yes | 70.6 | | |
| 15:31 | 72.7 | 82.8 | <110.0 | 75 | 61 | | | Yes | | | |
| 15:32 | 71 | 78.8 | <110.0 | 74 | 57 | | | Yes | | | |
| 15:33 | **74.6** | 84.6 | 111.7 | 78 | 53 | | | No | | | |
| 15:34 | 69.7 | 78 | <110.0 | 73 | 54 | | | Yes | | | |

pg. ____ of ____

NOISE MEASUREMENT DATA SHEET

DATE: 5-15-2014

EQUIPMENT : METER (Serial No.) 3 CALIBRATOR (Serial no.) 01807

CALIBRATION : START _____ dBA END _____ dBA

WEATHER DATA / NOTES: TEMP. _____ APPROX. REL. HUMIDITY _____ %

APPROX. WIND SPEED _____ mph

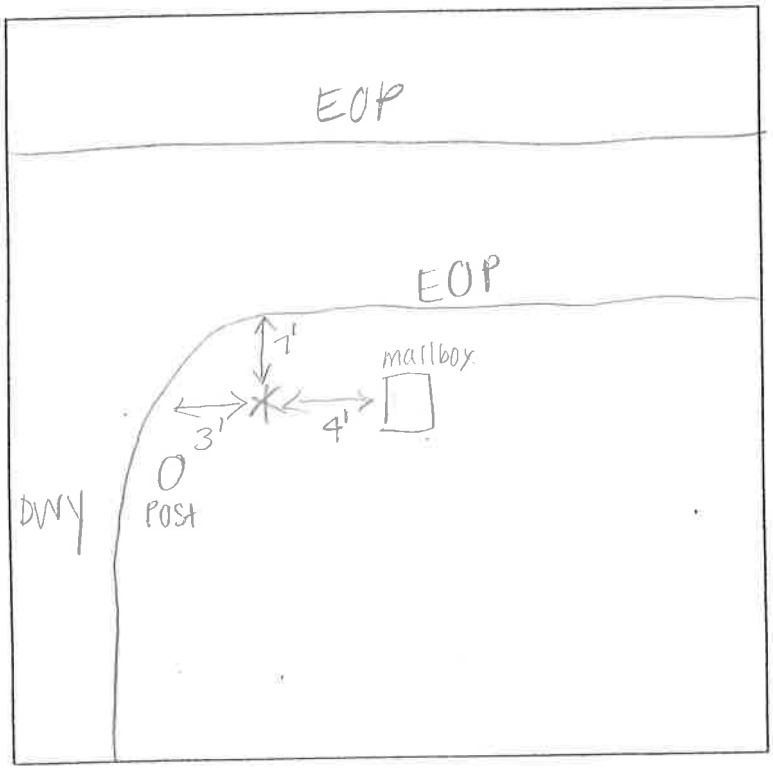
DIRECTION _____ (may also be noted on site diagram below)

ROUTE : PARK AVE LOCATION : TMS- D M- 11

COMMUNITY : PARK AVE RELOCATION START TIME: _____

INTERVAL LENGTH : 1:00

SITE DIAGRAM




TEST DURATION : _____

EVENTS LOG

| Time | Event |
|---|---|

TRAFFIC / OTHER NOTES : _____

## RECEPTOR M-12 - 21142 Arrow Safety Road

**Short-term Noise Measurement**

Start: 15:05 May 15, 2014

End: 15:35 May 15, 2014

| | | | | | | | | | Not Despiked | | | Despiked | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Leq dB(A) | Lmax dB(A) | Lmin dB(A) | L(5) dB(A) | L(10) dB(A) | L(50) dB(A) | L(90) dB(A) | L(95) dB(A) | 5-min Leq dB(A) | 30-min LeqdB(A) | Valid? | 5-min Leq dB(A) | 30-min Leq dB(A) | Noise Level |
| 15:05 | 69.1 | 78.9 | 49.3 | 76.9 | 75.7 | 58.8 | 49.6 | 49.4 | | | Yes | | | |
| 15:06 | 69.7 | 81.7 | 48.3 | 79.8 | 72.6 | 53.6 | 49.1 | 48.9 | | | Yes | | | |
| 15:07 | 68.7 | 80.7 | 47.2 | 77.2 | 71.8 | 52.9 | 48.1 | 48.0 | 68.8 | | Yes | 68.8 | | |
| 15:08 | 66.4 | 79.4 | 48.2 | 73.1 | 70.4 | 54.4 | 49.0 | 48.7 | | | Yes | | | |
| 15:09 | 69.3 | 82.6 | 47.3 | 75.8 | 71.9 | 52.5 | 47.5 | 47.3 | | | Yes | | | |
| 15:10 | 60.7 | 75.6 | 46.7 | 70.4 | 54.9 | 50.9 | 47.8 | 47.1 | | | Yes | | | |
| 15:11 | **71.7** | 84.9 | 50.2 | 77.6 | 76.5 | 59.9 | 51.5 | 50.5 | | | No | | | |
| 15:12 | 66.8 | 74.3 | 50.2 | 74.2 | 72.7 | 59.6 | 51.9 | 50.3 | 68.0 | | Yes | 66.3 | | |
| 15:13 | 69.1 | 76.1 | 50.7 | 75.6 | 74.7 | 61.2 | 53.2 | 51.4 | | | Yes | | | |
| 15:14 | 64.7 | 73.9 | 47.9 | 72.9 | 71.0 | 58.2 | 52.3 | 51.2 | | | Yes | | | |
| 15:15 | 66.7 | 79.5 | 46.2 | 73.8 | 71.4 | 51.1 | 46.6 | 46.1 | | | Yes | | | |
| 15:16 | 66.2 | 74.0 | 48.2 | 73.9 | 71.7 | 57.1 | 49.3 | 49.2 | | | Yes | | | |
| 15:17 | 63.9 | 72.8 | 48.2 | 71.7 | 71.3 | 54.1 | 48.8 | 48.2 | 68.3 | | Yes | 66.0 | | |
| 15:18 | 66.7 | 77.7 | 47.2 | 77.6 | 70.4 | 52.2 | 47.9 | 47.4 | | | Yes | | | |
| 15:19 | **72.5** | 85.3 | 50.1 | 80.2 | 77.0 | 58.2 | 52.9 | 50.7 | | | No | | | |
| 15:20 | 65.4 | 75.0 | 48.8 | 74.3 | 70.3 | 54.8 | 49.3 | 49.1 | | | Yes | | | |
| 15:21 | 67.8 | 77.8 | 45.0 | 77.7 | 74.5 | 51.2 | 46.1 | 45.2 | | | Yes | | | |
| 15:22 | 60.2 | 71.9 | 46.6 | 70.2 | 63.4 | 48.9 | 47.2 | 46.8 | 65.3 | | Yes | 65.3 | | |
| 15:23 | 66.8 | 77.0 | 46.7 | 76.1 | 72.8 | 52.0 | 47.2 | 46.6 | | | Yes | | | |
| 15:24 | 62.1 | 73.6 | 49.4 | 71.0 | 65.8 | 53.3 | 50.4 | 49.8 | | | Yes | | | |
| 15:25 | 66.4 | 74.7 | 47.4 | 73.8 | 72.4 | 57.6 | 47.7 | 47.4 | | | Yes | | | |
| 15:26 | 52.8 | 56.6 | 47.3 | 55.6 | 55.3 | 52.4 | 49.1 | 48.3 | | | Yes | | | |
| 15:27 | 68.2 | 80.1 | 49.3 | 77.7 | 73.4 | 52.0 | 49.9 | 49.8 | 65.5 | | Yes | 65.5 | | |
| 15:28 | 60.2 | 69.9 | 50.5 | 69.6 | 64.9 | 53.2 | 51.1 | 50.8 | | | Yes | | | |
| 15:29 | 67.4 | 77.2 | 49.9 | 76.0 | 71.9 | 55.8 | 51.3 | 50.4 | | | Yes | | | |
| 15:30 | 56.3 | 70.8 | 47.6 | 57.8 | 51.6 | 49.0 | 48.0 | 47.9 | | | Yes | | | |
| 15:31 | 67.0 | 78.8 | 48.7 | 74.6 | 71.3 | 52.3 | 50.0 | 48.9 | | | Yes | | | |
| 15:32 | 62.6 | 74.4 | 49.9 | 71.8 | 66.8 | 52.6 | 50.3 | 50.2 | 64.7 | | Yes | 64.7 | | |
| 15:33 | 65.0 | 78.0 | 49.3 | 76.3 | 61.2 | 51.5 | 49.6 | 49.4 | | | Yes | | | |
| 15:34 | 66.4 | 72.2 | 54.2 | 73.1 | 73.1 | 63.0 | 56.8 | 55.3 | | | Yes | | | |
| | | | | | | | | | | 67.1 | | | 66.3 | **66** |

pg. ____ of ____

NOISE MEASUREMENT DATA SHEET

DATE: 5-15-2014

EQUIPMENT : METER (Serial No.) R10N CALIBRATOR (Serial no.) 01807

CALIBRATION : START _____ dBA END _____ dBA

WEATHER DATA / NOTES: TEMP. 82 APPROX. REL. HUMIDITY 56 %

APPROX. WIND SPEED 5-9 mph

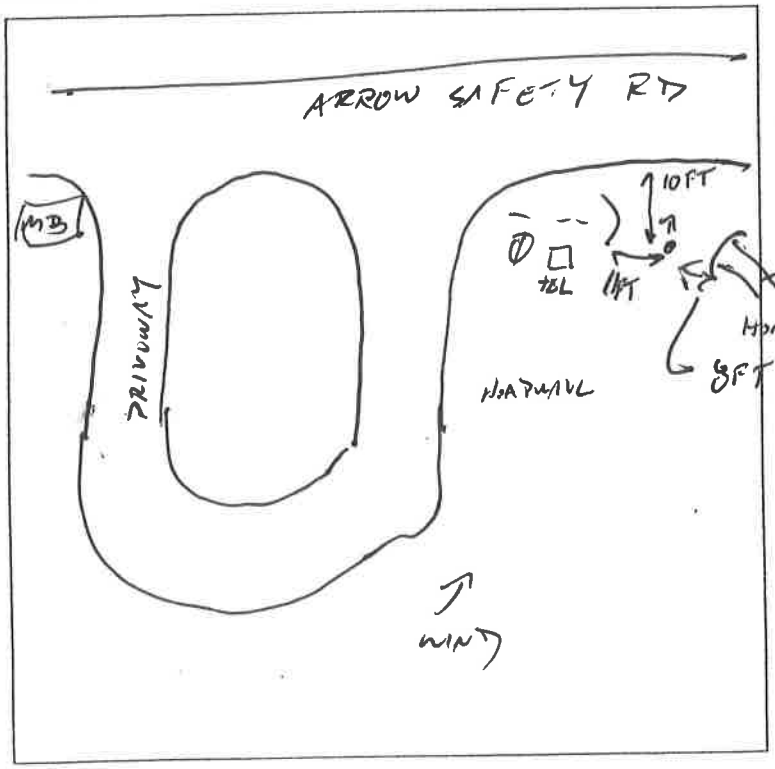
DIRECTION _____ (may also be noted on site diagram below)

ROUTE : PARK AVE LOCATION : TMS-D M-12D 21142 ARROW SAFETY

COMMUNITY : PARK AVE RELOCATION START TIME: 3:03 - 3:35

INTERVAL LENGTH : 1:00

SITE DIAGRAM




TEST DURATION : _____

EVENTS LOG

| Time | Event |
|---|---|
| 3:25 | SOME SORT OF ENGINE NOISE IN DISTANCE FAINT BUT NOTICABLE |
| 3:27 | SMALL PROP PLANE OVERHEAD |

TRAFFIC / OTHER NOTES : _____

A SIGNIFICANT AMOUNT OF BUSES

# Appendix C – TNM Model Traffic And Peak Traffic Volumes

| TNM Traffic Input for Traffic Monitoring Session | | | | | |
|---|---|---|---|---|---|
| Roadway | Autos (vph)[1] | Medium Trucks (vph)[1] | Heavy Trucks (vph)[1] | Total Volume (vph)[1] | Speed (mph)[2] |
| TMS A | | | | | |
| US 9 Westbound West of Park Ave | 356 | 16 | 8 | 380 | 47 |
| US 9 Eastbound West of Park Ave | 324 | 10 | 6 | 340 | 49 |
| US 9 Westbound East of Park Ave | 370 | 22 | 18 | 410 | 47 |
| US 9 Eastbound East of Park Ave | 312 | 8 | 6 | 326 | 49 |
| Park Ave Northbound South of US 9 | 90 | 8 | 16 | 114 | 48 |
| Park Ave Southbound South of US 9 | 66 | 10 | 12 | 88 | 48 |
| TMS B | | | | | |
| Springfield Road Eastbound East of Park Ave | 48 | 2 | 4 | 54 | 25 |
| Springfield Road Westbound West of Park Ave | 58 | 6 | 4 | 68 | 25 |
| Park Ave Northbound South of Springfield Road | 102 | 6 | 18 | 126 | 48 |
| Park Ave Southbound South of Springfield Road | 110 | 14 | 14 | 138 | 48 |
| Park Ave Northbound North of Springfield Road | 84 | 6 | 14 | 104 | 48 |
| Park Ave Southbound North of Springfield Road | 66 | 10 | 12 | 88 | 48 |
| TMS C | | | | | |
| Woodbranch Road Northbound North of Cedar Lane | 28 | 2 | 0 | 30 | 25 |
| Woodbranch Road Southbound North of Cedar Lane | 56 | 4 | 0 | 60 | 25 |
| Woodbranch Road Northbound South of Cedar Lane | 20 | 2 | 2 | 24 | 25 |
| Woodbranch Road Southbound South of Cedar Lane | 42 | 2 | 0 | 44 | 25 |
| Cedar Lane Northbound North of Woodbranch Road | 10 | 2 | 2 | 14 | 25 |
| Cedar Lane Southbound North of Woodbranch Road | 10 | 0 | 0 | 10 | 25 |
| Cedar Lane Northbound South of Woodbranch Road | 20 | 2 | 0 | 22 | 25 |
| Cedar Lane Southbound South of Woodbranch Road | 26 | 2 | 0 | 28 | 25 |
| Park Ave Northbound South of Cedar Lane | 116 | 2 | 24 | 142 | 50 |
| Park Ave Southbound South of Cedar Lane | 146 | 2 | 24 | 172 | 48 |
| Park Ave Northbound North of Cedar Lane | 106 | 2 | 24 | 132 | 50 |
| Park Ave Southbound North of Cedar Lane | 136 | 2 | 20 | 158 | 48 |
| Park Ave Northbound North of Woodbranch Road | 126 | 4 | 24 | 154 | 50 |
| Park Ave Southbound North of Woodbranch Road | 184 | 4 | 20 | 208 | 48 |
| TMS D | | | | | |
| Arrow Road Westbound | 104 | 16 | 4 | 124 | 41 |
| Arrow Road Eastbound | 64 | 10 | 4 | 78 | 41 |
| South Bedford Street Northbound North of Arrow Road | 370 | 18 | 6 | 394 | 42 |
| South Bedford Street Southbound North of Arrow Road | 302 | 24 | 14 | 340 | 42 |
| South Bedford Street Northbound South of Arrow Road | 414 | 14 | 2 | 430 | 42 |
| South Bedford Street Southbound South of Arrow Road | 300 | 12 | 10 | 322 | 42 |

[1]vph=vehicles per hour

[2]mph=miles per hour

| 2014 Peak Traffic Volume Summary | | | | | |
|---|---|---|---|---|---|
| Roadway | Autos (vph)[1] | Medium Trucks (vph)[1] | Heavy Trucks (vph)[1] | Total Volume (vph)[1] | Speed (mph)[2] |
| US 9 Westbound West of Park Ave | 426 | 13 | 11 | 450 | 47 |
| US 9 Eastbound West of Park Ave | 445 | 20 | 5 | 470 | 49 |
| US 9 Westbound East of Park Ave | 478 | 15 | 12 | 505 | 49 |
| US 9 Eastbound East of Park Ave | 515 | 23 | 7 | 545 | 49 |
| Park Ave Northbound South of US 9 | 198 | 11 | 11 | 220 | 48 |
| Park Ave Southbound South of US 9 | 168 | 8 | 8 | 184 | 48 |
| Park Ave Northbound South of Springfield Road | 198 | 11 | 11 | 220 | 48 |
| Park Ave Southbound South of Springfield Road | 168 | 8 | 8 | 184 | 48 |
| Park Ave Northbound North of Springfield Road | 198 | 11 | 11 | 220 | 48 |
| Park Ave Southbound North of Springfield Road | 168 | 8 | 8 | 184 | 48 |
| Park Ave Northbound South of Cedar Lane | 198 | 11 | 11 | 220 | 48 |
| Park Ave Southbound South of Cedar Lane | 168 | 8 | 8 | 184 | 48 |
| Park Ave Northbound North of Cedar Lane | 198 | 11 | 11 | 220 | 48 |
| Park Ave Southbound North of Cedar Lane | 168 | 8 | 8 | 184 | 48 |
| Park Ave Northbound North of Woodbranch Road | 198 | 11 | 11 | 220 | 48 |
| Park Ave Southbound North of Woodbranch Road | 168 | 8 | 8 | 184 | 48 |
| Arrow Road Westbound | 88 | 8 | 4 | 100 | 41 |
| Arrow Road Eastbound | 58 | 5 | 2 | 65 | 41 |
| South Bedford Street Northbound South of Arrow Road | 281 | 14 | 10 | 305 | 42 |
| South Bedford Street Southbound South of Arrow Road | 307 | 22 | 11 | 340 | 42 |

[1]vph=vehicles per hour

[2]mph=miles per hour

| 2040 Peak Traffic Volume Summary | | | | | |
|---|---|---|---|---|---|
| Roadway | Autos (vph)[1] | Medium Trucks (vph)[1] | Heavy Trucks (vph)[1] | Total Volume (vph)[1] | Speed (mph)[2] |
| US 9 Westbound West of Park Ave | 506 | 16 | 13 | 535 | 50 |
| US 9 Eastbound West of Park Ave | 530 | 24 | 6 | 560 | 50 |
| US 9 Westbound East of Park Ave | 582 | 18 | 15 | 615 | 50 |
| US 9 Eastbound East of Park Ave | 629 | 28 | 8 | 665 | 50 |
| Park Ave Northbound South of US 9 | 268 | 20 | 23 | 311 | 50 |
| Park Ave Southbound South of US 9 | 242 | 20 | 23 | 285 | 50 |
| Park Ave Northbound South of Springfield Road | 268 | 20 | 23 | 311 | 50 |
| Park Ave Southbound South of Springfield Road | 242 | 20 | 23 | 285 | 50 |
| Park Ave Northbound North of Springfield Road | 268 | 20 | 23 | 311 | 50 |
| Park Ave Southbound North of Springfield Road | 242 | 20 | 23 | 285 | 50 |
| Park Ave Northbound South of Cedar Lane | 268 | 20 | 23 | 311 | 50 |
| Park Ave Southbound South of Cedar Lane | 242 | 20 | 23 | 285 | 50 |
| Park Ave Northbound North of Cedar Lane | 268 | 20 | 23 | 311 | 50 |
| Park Ave Southbound North of Cedar Lane | 242 | 20 | 23 | 285 | 50 |
| Park Ave Northbound North of Woodbranch Road | 268 | 20 | 23 | 311 | 50 |
| Park Ave Southbound North of Woodbranch Road | 242 | 20 | 23 | 285 | 50 |
| Arrow Road Westbound | 196 | 20 | 8 | 224 | 41 |
| Arrow Road Eastbound | 109 | 9 | 4 | 122 | 41 |
| South Bedford Street Northbound South of Arrow Road | 281 | 14 | 10 | 305 | 42 |
| South Bedford Street Southbound South of Arrow Road | 307 | 22 | 11 | 340 | 42 |

[1]vph=vehicles per hour

[2]mph=miles per hour

# Appendix D – TNM Analysis Output

WRA/DelDOT
VAK
18 May 2016
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: Park Avenue Relocation
RUN: Park Ave Validation
BARRIER DESIGN: INPUT HEIGHTS
Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.
ATMOSPHERICS: 68 deg F, 50% RH

| Receiver Name | No. | #DUs | Existing LAeq1h | No Barrier LAeq1h Calculated | Crit'n | Increase over existing Calculated | Crit'n Sub'l Inc | Type Impact | With Barrier Calculated LAeq1h | Noise Reduction Calculated | Goal | Calculated minus Goal |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | dBA | dBA | dBA | dB | dB | | dBA | dB | dB | dB |
| M-01A | 2 | 1 | 0.0 | 66.9 | 66 | 66.9 | 10 | Snd Lvl | 66.9 | 0.0 | 8 | -8.0 |
| M-02A | 4 | 1 | 0.0 | 45.7 | 66 | 45.7 | 10 | ---- | 45.7 | 0.0 | 8 | -8.0 |
| M-03A | 5 | 1 | 0.0 | 68.4 | 66 | 68.4 | 10 | Snd Lvl | 68.4 | 0.0 | 8 | -8.0 |
| M-04B | 6 | 1 | 0.0 | 0.0 | 66 | 0.0 | 10 | inactive | 0.0 | 0.0 | 8 | 0.0 |
| M-05B | 7 | 1 | 0.0 | 0.0 | 66 | 0.0 | 10 | inactive | 0.0 | 0.0 | 8 | 0.0 |
| M-06B | 8 | 1 | 0.0 | 0.0 | 66 | 0.0 | 10 | inactive | 0.0 | 0.0 | 8 | 0.0 |
| M-07C | 9 | 1 | 0.0 | 0.0 | 66 | 0.0 | 10 | inactive | 0.0 | 0.0 | 8 | 0.0 |
| M-08C | 10 | 1 | 0.0 | 0.0 | 66 | 0.0 | 10 | inactive | 0.0 | 0.0 | 8 | 0.0 |
| M-09C | 11 | 1 | 0.0 | 0.0 | 66 | 0.0 | 10 | inactive | 0.0 | 0.0 | 8 | 0.0 |
| M-10D | 12 | 1 | 0.0 | 0.0 | 66 | 0.0 | 10 | inactive | 0.0 | 0.0 | 8 | 0.0 |
| M-11D | 13 | 1 | 0.0 | 0.0 | 66 | 0.0 | 10 | inactive | 0.0 | 0.0 | 8 | 0.0 |
| M-12D | 14 | 1 | 0.0 | 0.0 | 66 | 0.0 | 10 | inactive | 0.0 | 0.0 | 8 | 0.0 |

| Dwelling Units | # DUs | Noise Reduction Min | Avg | Max |
|---|---|---|---|---|
| | | dB | dB | dB |
| All Selected | 12 | 0.0 | 0.0 | 0.0 |
| All Impacted | 2 | 0.0 | 0.0 | 0.0 |
| All that meet NR Goal | 0 | 0.0 | 0.0 | 0.0 |

RESULTS: SOUND LEVELS

Park Avenue Relocation

WRA/DelDOT

18 May 2016

VAK

TNM 2.5

Calculated with TNM 2.5

RESULTS: SOUND LEVELS

PROJECT/CONTRACT: Park Avenue Relocation

RUN: Park Ave Validation

BARRIER DESIGN: INPUT HEIGHTS

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

ATMOSPHERICS: 68 deg F, 50% RH

| Receiver Name | No. | #DUs | Existing LAeq1h | No Barrier LAeq1h Calculated | Crit'n | Increase over existing Calculated | Crit'n Sub'l Inc | Type Impact | With Barrier Calculated LAeq1h | Noise Reduction Calculated | Goal | Calculated minus Goal |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | dBA | dBA | dBA | dB | dB | | dBA | dB | dB | dB |
| M-01A | 2 | 1 | 0.0 | 0.0 | 66 | 0.0 | 10 | inactive | 0.0 | 0.0 | 8 | 0.0 |
| M-02A | 4 | 1 | 0.0 | 0.0 | 66 | 0.0 | 10 | inactive | 0.0 | 0.0 | 8 | 0.0 |
| M-03A | 5 | 1 | 0.0 | 0.0 | 66 | 0.0 | 10 | inactive | 0.0 | 0.0 | 8 | 0.0 |
| M-04B | 6 | 1 | 0.0 | 66.6 | 66 | 66.6 | 10 | Snd Lvl | 66.6 | 0.0 | 8 | -8.0 |
| M-05B | 7 | 1 | 0.0 | 67.2 | 66 | 67.2 | 10 | Snd Lvl | 67.2 | 0.0 | 8 | -8.0 |
| M-06B | 8 | 1 | 0.0 | 69.9 | 66 | 69.9 | 10 | Snd Lvl | 69.9 | 0.0 | 8 | -8.0 |
| M-07C | 9 | 1 | 0.0 | 0.0 | 66 | 0.0 | 10 | inactive | 0.0 | 0.0 | 8 | 0.0 |
| M-08C | 10 | 1 | 0.0 | 0.0 | 66 | 0.0 | 10 | inactive | 0.0 | 0.0 | 8 | 0.0 |
| M-09C | 11 | 1 | 0.0 | 0.0 | 66 | 0.0 | 10 | inactive | 0.0 | 0.0 | 8 | 0.0 |
| M-10D | 12 | 1 | 0.0 | 0.0 | 66 | 0.0 | 10 | inactive | 0.0 | 0.0 | 8 | 0.0 |
| M-11D | 13 | 1 | 0.0 | 0.0 | 66 | 0.0 | 10 | inactive | 0.0 | 0.0 | 8 | 0.0 |
| M-12D | 14 | 1 | 0.0 | 0.0 | 66 | 0.0 | 10 | inactive | 0.0 | 0.0 | 8 | 0.0 |

| Dwelling Units | # DUs | Noise Reduction Min | Avg | Max |
|---|---|---|---|---|
| | | dB | dB | dB |
| All Selected | 12 | 0.0 | 0.0 | 0.0 |
| All Impacted | 3 | 0.0 | 0.0 | 0.0 |
| All that meet NR Goal | 0 | 0.0 | 0.0 | 0.0 |

RESULTS: SOUND LEVELS

Park Avenue Relocation

WRA/DelDOT

18 May 2016

VAK

TNM 2.5

Calculated with TNM 2.5

RESULTS: SOUND LEVELS

PROJECT/CONTRACT: Park Avenue Relocation

RUN: Park Ave Validation

BARRIER DESIGN: INPUT HEIGHTS

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

ATMOSPHERICS: 68 deg F, 50% RH

| Receiver Name | No. | #DUs | Existing LAeq1h | No Barrier LAeq1h Calculated | Crit'n | Increase over existing Calculated | Crit'n Sub'l Inc | Type Impact | With Barrier Calculated LAeq1h | Noise Reduction Calculated | Goal | Calculated minus Goal |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | dBA | dBA | dBA | dB | dB | | dBA | dB | dB | dB |
| M-01A | 2 | 1 | 0.0 | 0.0 | 66 | 0.0 | 10 | inactive | 0.0 | 0.0 | 8 | 0.0 |
| M-02A | 4 | 1 | 0.0 | 0.0 | 66 | 0.0 | 10 | inactive | 0.0 | 0.0 | 8 | 0.0 |
| M-03A | 5 | 1 | 0.0 | 0.0 | 66 | 0.0 | 10 | inactive | 0.0 | 0.0 | 8 | 0.0 |
| M-04B | 6 | 1 | 0.0 | 0.0 | 66 | 0.0 | 10 | inactive | 0.0 | 0.0 | 8 | 0.0 |
| M-05B | 7 | 1 | 0.0 | 0.0 | 66 | 0.0 | 10 | inactive | 0.0 | 0.0 | 8 | 0.0 |
| M-06B | 8 | 1 | 0.0 | 0.0 | 66 | 0.0 | 10 | inactive | 0.0 | 0.0 | 8 | 0.0 |
| M-07C | 9 | 1 | 0.0 | 71.0 | 66 | 71.0 | 10 | Snd Lvl | 71.0 | 0.0 | 8 | -8.0 |
| M-08C | 10 | 1 | 0.0 | 55.6 | 66 | 55.6 | 10 | ---- | 55.6 | 0.0 | 8 | -8.0 |
| M-09C | 11 | 1 | 0.0 | 69.6 | 66 | 69.6 | 10 | Snd Lvl | 69.6 | 0.0 | 8 | -8.0 |
| M-10D | 12 | 1 | 0.0 | 0.0 | 66 | 0.0 | 10 | inactive | 0.0 | 0.0 | 8 | 0.0 |
| M-11D | 13 | 1 | 0.0 | 0.0 | 66 | 0.0 | 10 | inactive | 0.0 | 0.0 | 8 | 0.0 |
| M-12D | 14 | 1 | 0.0 | 0.0 | 66 | 0.0 | 10 | inactive | 0.0 | 0.0 | 8 | 0.0 |

| Dwelling Units | # DUs | Noise Reduction Min | Avg | Max |
|---|---|---|---|---|
| | | dB | dB | dB |
| All Selected | 12 | 0.0 | 0.0 | 0.0 |
| All Impacted | 2 | 0.0 | 0.0 | 0.0 |
| All that meet NR Goal | 0 | 0.0 | 0.0 | 0.0 |

RESULTS: SOUND LEVELS

Park Avenue Relocation

WRA/DelDOT

18 May 2016

VAK

TNM 2.5

Calculated with TNM 2.5

RESULTS: SOUND LEVELS

PROJECT/CONTRACT: Park Avenue Relocation

RUN: Park Ave Validation

BARRIER DESIGN: INPUT HEIGHTS

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

ATMOSPHERICS: 68 deg F, 50% RH

| Receiver Name | No. | #DUs | Existing LAeq1h | No Barrier LAeq1h Calculated | Crit'n | Increase over existing Calculated | Crit'n Sub'l Inc | Type Impact | With Barrier Calculated LAeq1h | Noise Reduction Calculated | Goal | Calculated minus Goal |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | dBA | dBA | dBA | dB | dB | | dBA | dB | dB | dB |
| M-01A | 2 | 1 | 0.0 | 0.0 | 66 | 0.0 | 10 | inactive | 0.0 | 0.0 | 8 | 0.0 |
| M-02A | 4 | 1 | 0.0 | 0.0 | 66 | 0.0 | 10 | inactive | 0.0 | 0.0 | 8 | 0.0 |
| M-03A | 5 | 1 | 0.0 | 0.0 | 66 | 0.0 | 10 | inactive | 0.0 | 0.0 | 8 | 0.0 |
| M-04B | 6 | 1 | 0.0 | 0.0 | 66 | 0.0 | 10 | inactive | 0.0 | 0.0 | 8 | 0.0 |
| M-05B | 7 | 1 | 0.0 | 0.0 | 66 | 0.0 | 10 | inactive | 0.0 | 0.0 | 8 | 0.0 |
| M-06B | 8 | 1 | 0.0 | 0.0 | 66 | 0.0 | 10 | inactive | 0.0 | 0.0 | 8 | 0.0 |
| M-07C | 9 | 1 | 0.0 | 0.0 | 66 | 0.0 | 10 | inactive | 0.0 | 0.0 | 8 | 0.0 |
| M-08C | 10 | 1 | 0.0 | 0.0 | 66 | 0.0 | 10 | inactive | 0.0 | 0.0 | 8 | 0.0 |
| M-09C | 11 | 1 | 0.0 | 0.0 | 66 | 0.0 | 10 | inactive | 0.0 | 0.0 | 8 | 0.0 |
| M-10D | 12 | 1 | 0.0 | 68.8 | 66 | 68.8 | 10 | Snd Lvl | 68.8 | 0.0 | 8 | -8.0 |
| M-11D | 13 | 1 | 0.0 | 70.0 | 66 | 70.0 | 10 | Snd Lvl | 70.0 | 0.0 | 8 | -8.0 |
| M-12D | 14 | 1 | 0.0 | 65.4 | 66 | 65.4 | 10 | ---- | 65.4 | 0.0 | 8 | -8.0 |

| Dwelling Units | # DUs | Noise Reduction Min | Avg | Max |
|---|---|---|---|---|
| | | dB | dB | dB |
| All Selected | 12 | 0.0 | 0.0 | 0.0 |
| All Impacted | 2 | 0.0 | 0.0 | 0.0 |
| All that meet NR Goal | 0 | 0.0 | 0.0 | 0.0 |

WRA/DelDOT
<Analysis By?>
RESULTS: SOUND LEVELS
PROJECT/CONTRACT: Park Avenue Relocation
RUN: Park Ave Existing peak noise levels
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

9 May 2016
TNM 2.5
Calculated with TNM 2.5

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

| Receiver Name | No. | #DUs | Existing LAeq1h | No Barrier LAeq1h Calculated | Crit'n | Increase over existing Calculated | Crit'n Sub'l Inc | Type Impact | With Barrier Calculated LAeq1h | Noise Reduction Calculated | Goal | Calculated minus Goal |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | dBA | dBA | dBA | dB | dB | | dBA | dB | dB | dB |
| M-01A | 2 | 1 | 0.0 | 68.8 | 66 | 68.8 | 10 | Snd Lvl | 68.8 | 0.0 | 8 | -8.0 |
| M-02A | 4 | 1 | 0.0 | 46.2 | 66 | 46.2 | 10 | ---- | 46.2 | 0.0 | 8 | -8.0 |
| M-03A | 5 | 1 | 0.0 | 69.2 | 66 | 69.2 | 10 | Snd Lvl | 69.2 | 0.0 | 8 | -8.0 |
| M-04B | 6 | 1 | 0.0 | 67.9 | 66 | 67.9 | 10 | Snd Lvl | 67.9 | 0.0 | 8 | -8.0 |
| M-05B | 7 | 1 | 0.0 | 68.6 | 66 | 68.6 | 10 | Snd Lvl | 68.6 | 0.0 | 8 | -8.0 |
| M-06B | 8 | 1 | 0.0 | 70.1 | 66 | 70.1 | 10 | Snd Lvl | 70.1 | 0.0 | 8 | -8.0 |
| M-07C | 9 | 1 | 0.0 | 70.4 | 66 | 70.4 | 10 | Snd Lvl | 70.4 | 0.0 | 8 | -8.0 |
| M-08C | 10 | 1 | 0.0 | 45.9 | 66 | 45.9 | 10 | ---- | 45.9 | 0.0 | 8 | -8.0 |
| M-09C | 11 | 1 | 0.0 | 68.6 | 66 | 68.6 | 10 | Snd Lvl | 68.6 | 0.0 | 8 | -8.0 |
| M-10D | 12 | 1 | 0.0 | 68.4 | 66 | 68.4 | 10 | Snd Lvl | 68.4 | 0.0 | 8 | -8.0 |
| M-11D | 13 | 1 | 0.0 | 70.1 | 66 | 70.1 | 10 | Snd Lvl | 70.1 | 0.0 | 8 | -8.0 |
| M-12D | 14 | 1 | 0.0 | 63.8 | 66 | 63.8 | 10 | ---- | 63.8 | 0.0 | 8 | -8.0 |
| R-01 | 166 | 1 | 0.0 | 51.4 | 66 | 51.4 | 10 | ---- | 51.4 | 0.0 | 8 | -8.0 |
| R-02 | 168 | 1 | 0.0 | 46.2 | 66 | 46.2 | 10 | ---- | 46.2 | 0.0 | 8 | -8.0 |
| R-03 | 169 | 1 | 0.0 | 57.5 | 66 | 57.5 | 10 | ---- | 57.5 | 0.0 | 8 | -8.0 |
| R-04 | 170 | 1 | 0.0 | 53.2 | 66 | 53.2 | 10 | ---- | 53.2 | 0.0 | 8 | -8.0 |
| R-05 | 171 | 1 | 0.0 | 50.8 | 66 | 50.8 | 10 | ---- | 50.8 | 0.0 | 8 | -8.0 |
| R-06 | 172 | 1 | 0.0 | 49.4 | 66 | 49.4 | 10 | ---- | 49.4 | 0.0 | 8 | -8.0 |
| R-07 | 173 | 1 | 0.0 | 48.4 | 66 | 48.4 | 10 | ---- | 48.4 | 0.0 | 8 | -8.0 |
| R-08 | 174 | 1 | 0.0 | 47.8 | 66 | 47.8 | 10 | ---- | 47.8 | 0.0 | 8 | -8.0 |
| R-09 | 175 | 1 | 0.0 | 47.4 | 66 | 47.4 | 10 | ---- | 47.4 | 0.0 | 8 | -8.0 |
| R-10 | 176 | 1 | 0.0 | 61.4 | 66 | 61.4 | 10 | ---- | 61.4 | 0.0 | 8 | -8.0 |
| R-11 | 177 | 1 | 0.0 | 55.4 | 66 | 55.4 | 10 | ---- | 55.4 | 0.0 | 8 | -8.0 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R-12 | 178 | 1 | 0.0 | 55.2 | 66 | 55.2 | 10 | ---- | 55.2 | 0.0 | 8 | -8.0 |
| R-13 | 179 | 1 | 0.0 | 57.2 | 66 | 57.2 | 10 | ---- | 57.2 | 0.0 | 8 | -8.0 |
| R-14 | 180 | 1 | 0.0 | 57.3 | 66 | 57.3 | 10 | ---- | 57.3 | 0.0 | 8 | -8.0 |
| R-15 | 181 | 1 | 0.0 | 55.0 | 66 | 55.0 | 10 | ---- | 55.0 | 0.0 | 8 | -8.0 |
| R-16 | 182 | 1 | 0.0 | 54.8 | 66 | 54.8 | 10 | ---- | 54.8 | 0.0 | 8 | -8.0 |
| R-17 | 183 | 1 | 0.0 | 57.4 | 66 | 57.4 | 10 | ---- | 57.4 | 0.0 | 8 | -8.0 |
| R-18 | 184 | 1 | 0.0 | 56.9 | 66 | 56.9 | 10 | ---- | 56.9 | 0.0 | 8 | -8.0 |
| R-19 | 186 | 1 | 0.0 | 47.4 | 66 | 47.4 | 10 | ---- | 47.4 | 0.0 | 8 | -8.0 |
| R-20 | 187 | 1 | 0.0 | 40.4 | 66 | 40.4 | 10 | ---- | 40.4 | 0.0 | 8 | -8.0 |
| R-21 | 188 | 1 | 0.0 | 58.6 | 66 | 58.6 | 10 | ---- | 58.6 | 0.0 | 8 | -8.0 |
| R-22 | 189 | 1 | 0.0 | 51.4 | 66 | 51.4 | 10 | ---- | 51.4 | 0.0 | 8 | -8.0 |
| R-23 | 190 | 1 | 0.0 | 46.1 | 66 | 46.1 | 10 | ---- | 46.1 | 0.0 | 8 | -8.0 |
| R-24 | 191 | 1 | 0.0 | 47.3 | 66 | 47.3 | 10 | ---- | 47.3 | 0.0 | 8 | -8.0 |
| R-25 | 192 | 1 | 0.0 | 50.2 | 66 | 50.2 | 10 | ---- | 50.2 | 0.0 | 8 | -8.0 |
| R-26 | 193 | 1 | 0.0 | 52.3 | 66 | 52.3 | 10 | ---- | 52.3 | 0.0 | 8 | -8.0 |
| R-27 | 194 | 1 | 0.0 | 62.4 | 66 | 62.4 | 10 | ---- | 62.4 | 0.0 | 8 | -8.0 |
| R-28 | 195 | 1 | 0.0 | 61.3 | 66 | 61.3 | 10 | ---- | 61.3 | 0.0 | 8 | -8.0 |
| R-29 | 196 | 1 | 0.0 | 61.0 | 66 | 61.0 | 10 | ---- | 61.0 | 0.0 | 8 | -8.0 |
| R-30 | 197 | 1 | 0.0 | 60.8 | 66 | 60.8 | 10 | ---- | 60.8 | 0.0 | 8 | -8.0 |
| R-31 | 198 | 1 | 0.0 | 60.9 | 66 | 60.9 | 10 | ---- | 60.9 | 0.0 | 8 | -8.0 |
| R-32 | 199 | 1 | 0.0 | 56.0 | 66 | 56.0 | 10 | ---- | 56.0 | 0.0 | 8 | -8.0 |
| R-33 | 200 | 1 | 0.0 | 61.1 | 66 | 61.1 | 10 | ---- | 61.1 | 0.0 | 8 | -8.0 |
| R-34 | 201 | 1 | 0.0 | 55.7 | 66 | 55.7 | 10 | ---- | 55.7 | 0.0 | 8 | -8.0 |
| R-35 | 202 | 1 | 0.0 | 55.0 | 66 | 55.0 | 10 | ---- | 55.0 | 0.0 | 8 | -8.0 |
| R-36 | 203 | 1 | 0.0 | 58.4 | 66 | 58.4 | 10 | ---- | 58.4 | 0.0 | 8 | -8.0 |
| R-37 | 204 | 1 | 0.0 | 53.1 | 66 | 53.1 | 10 | ---- | 53.1 | 0.0 | 8 | -8.0 |
| R-38 | 205 | 1 | 0.0 | 61.5 | 66 | 61.5 | 10 | ---- | 61.5 | 0.0 | 8 | -8.0 |
| R-39 | 206 | 1 | 0.0 | 55.1 | 66 | 55.1 | 10 | ---- | 55.1 | 0.0 | 8 | -8.0 |
| R-40 | 207 | 1 | 0.0 | 53.2 | 66 | 53.2 | 10 | ---- | 53.2 | 0.0 | 8 | -8.0 |
| R-41 | 208 | 1 | 0.0 | 53.4 | 66 | 53.4 | 10 | ---- | 53.4 | 0.0 | 8 | -8.0 |
| R-42 | 209 | 1 | 0.0 | 53.7 | 66 | 53.7 | 10 | ---- | 53.7 | 0.0 | 8 | -8.0 |
| R-43 | 210 | 1 | 0.0 | 53.6 | 66 | 53.6 | 10 | ---- | 53.6 | 0.0 | 8 | -8.0 |
| R-44 | 211 | 1 | 0.0 | 55.2 | 66 | 55.2 | 10 | ---- | 55.2 | 0.0 | 8 | -8.0 |
| R-45 | 212 | 1 | 0.0 | 55.7 | 66 | 55.7 | 10 | ---- | 55.7 | 0.0 | 8 | -8.0 |
| R-46 | 214 | 1 | 0.0 | 59.4 | 66 | 59.4 | 10 | ---- | 59.4 | 0.0 | 8 | -8.0 |
| R-47 | 215 | 1 | 0.0 | 61.4 | 66 | 61.4 | 10 | ---- | 61.4 | 0.0 | 8 | -8.0 |
| R-48 | 216 | 1 | 0.0 | 58.8 | 66 | 58.8 | 10 | ---- | 58.8 | 0.0 | 8 | -8.0 |
| R-49 | 217 | 1 | 0.0 | 58.7 | 66 | 58.7 | 10 | ---- | 58.7 | 0.0 | 8 | -8.0 |
| R-50 | 218 | 1 | 0.0 | 56.7 | 66 | 56.7 | 10 | ---- | 56.7 | 0.0 | 8 | -8.0 |
| R-51 | 219 | 1 | 0.0 | 59.1 | 66 | 59.1 | 10 | ---- | 59.1 | 0.0 | 8 | -8.0 |
| R-52 | 220 | 1 | 0.0 | 57.3 | 66 | 57.3 | 10 | ---- | 57.3 | 0.0 | 8 | -8.0 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R-53 | 221 | 1 | 0.0 | 58.3 | 66 | 58.3 | 10 | ---- | 58.3 | 0.0 | 8 | -8.0 |
| R-54 | 222 | 1 | 0.0 | 58.4 | 66 | 58.4 | 10 | ---- | 58.4 | 0.0 | 8 | -8.0 |
| R-55 | 223 | 1 | 0.0 | 58.4 | 66 | 58.4 | 10 | ---- | 58.4 | 0.0 | 8 | -8.0 |
| R-56 | 224 | 1 | 0.0 | 60.4 | 66 | 60.4 | 10 | ---- | 60.4 | 0.0 | 8 | -8.0 |
| R-57 | 225 | 1 | 0.0 | 55.7 | 66 | 55.7 | 10 | ---- | 55.7 | 0.0 | 8 | -8.0 |
| R-58 | 226 | 1 | 0.0 | 61.0 | 66 | 61.0 | 10 | ---- | 61.0 | 0.0 | 8 | -8.0 |
| R-59 | 227 | 1 | 0.0 | 58.8 | 66 | 58.8 | 10 | ---- | 58.8 | 0.0 | 8 | -8.0 |
| R-60 | 228 | 1 | 0.0 | 61.0 | 66 | 61.0 | 10 | ---- | 61.0 | 0.0 | 8 | -8.0 |
| R-61 | 230 | 1 | 0.0 | 56.7 | 66 | 56.7 | 10 | ---- | 56.7 | 0.0 | 8 | -8.0 |
| R-62 | 231 | 1 | 0.0 | 62.9 | 66 | 62.9 | 10 | ---- | 62.9 | 0.0 | 8 | -8.0 |
| R-63 | 232 | 1 | 0.0 | 48.8 | 66 | 48.8 | 10 | ---- | 48.8 | 0.0 | 8 | -8.0 |
| R-64 | 233 | 1 | 0.0 | 49.0 | 66 | 49.0 | 10 | ---- | 49.0 | 0.0 | 8 | -8.0 |
| R-65 | 234 | 1 | 0.0 | 48.8 | 66 | 48.8 | 10 | ---- | 48.8 | 0.0 | 8 | -8.0 |
| R-66 | 235 | 1 | 0.0 | 48.9 | 66 | 48.9 | 10 | ---- | 48.9 | 0.0 | 8 | -8.0 |
| R-67 | 236 | 1 | 0.0 | 49.7 | 66 | 49.7 | 10 | ---- | 49.7 | 0.0 | 8 | -8.0 |
| R-68 | 237 | 1 | 0.0 | 50.7 | 66 | 50.7 | 10 | ---- | 50.7 | 0.0 | 8 | -8.0 |
| R-69 | 238 | 1 | 0.0 | 51.8 | 66 | 51.8 | 10 | ---- | 51.8 | 0.0 | 8 | -8.0 |
| R-70 | 239 | 1 | 0.0 | 53.6 | 66 | 53.6 | 10 | ---- | 53.6 | 0.0 | 8 | -8.0 |
| R-71 | 240 | 1 | 0.0 | 55.6 | 66 | 55.6 | 10 | ---- | 55.6 | 0.0 | 8 | -8.0 |
| R-72 | 241 | 1 | 0.0 | 48.9 | 66 | 48.9 | 10 | ---- | 48.9 | 0.0 | 8 | -8.0 |
| R-73 | 242 | 1 | 0.0 | 51.2 | 66 | 51.2 | 10 | ---- | 51.2 | 0.0 | 8 | -8.0 |

| **Dwelling Units** | **# DUs** | **Noise Reduction** | | |
|---|---|---|---|---|
| | | **Min** | **Avg** | **Max** |
| | | **dB** | **dB** | **dB** |
| All Selected | 85 | 0.0 | 0.0 | 0.0 |
| All Impacted | 9 | 0.0 | 0.0 | 0.0 |
| All that meet NR Goal | 0 | 0.0 | 0.0 | 0.0 |

RESULTS: SOUND LEVELS

Park Avenue Relocation

WRA/DelDOT

7 August 2017

VAK

TNM 2.5

Calculated with TNM 2.5

RESULTS: SOUND LEVELS

PROJECT/CONTRACT: Park Avenue Relocation

RUN: Park Ave Validation

BARRIER DESIGN: INPUT HEIGHTS

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

ATMOSPHERICS: 68 deg F, 50% RH

| Receiver Name | No. | #DUs | Existing LAeq1h | No Barrier LAeq1h | | Increase over existing | | Type Impact | With Barrier | Noise Reduction | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Calculated | Crit'n | Calculated | Crit'n Sub'l Inc | | Calculated LAeq1h | Calculated | Goal | Calculated minus Goal |
| | | | dBA | dBA | dBA | dB | dB | | dBA | dB | dB | dB |
| M-01A | 2 | 1 | 0.0 | 71.6 | 66 | 71.6 | 10 | Snd Lvl | 71.6 | 0.0 | 8 | -8.0 |
| M-02A | 4 | 1 | 0.0 | 48.4 | 66 | 48.4 | 10 | ---- | 48.4 | 0.0 | 8 | -8.0 |
| M-03A | 5 | 1 | 0.0 | 72.2 | 66 | 72.2 | 10 | Snd Lvl | 72.2 | 0.0 | 8 | -8.0 |
| M-04B | 6 | 1 | 0.0 | 70.8 | 66 | 70.8 | 10 | Snd Lvl | 70.8 | 0.0 | 8 | -8.0 |
| M-05B | 7 | 1 | 0.0 | 71.5 | 66 | 71.5 | 10 | Snd Lvl | 71.5 | 0.0 | 8 | -8.0 |
| M-06B | 8 | 1 | 0.0 | 73.0 | 66 | 73.0 | 10 | Snd Lvl | 73.0 | 0.0 | 8 | -8.0 |
| M-07C | 9 | 1 | 0.0 | 73.5 | 66 | 73.5 | 10 | Snd Lvl | 73.5 | 0.0 | 8 | -8.0 |
| M-08C | 10 | 1 | 0.0 | 49.3 | 66 | 49.3 | 10 | ---- | 49.3 | 0.0 | 8 | -8.0 |
| M-09C | 11 | 1 | 0.0 | 68.5 | 66 | 68.5 | 10 | Snd Lvl | 68.5 | 0.0 | 8 | -8.0 |
| M-10D | 12 | 1 | 0.0 | 69.9 | 66 | 69.9 | 10 | Snd Lvl | 69.9 | 0.0 | 8 | -8.0 |
| M-11D | 13 | 1 | 0.0 | 71.2 | 66 | 71.2 | 10 | Snd Lvl | 71.2 | 0.0 | 8 | -8.0 |
| M-12D | 14 | 1 | 0.0 | 67.1 | 66 | 67.1 | 10 | Snd Lvl | 67.1 | 0.0 | 8 | -8.0 |
| R-01 | 16 | 1 | 0.0 | 55.8 | 66 | 55.8 | 10 | ---- | 55.8 | 0.0 | 8 | -8.0 |
| R-02 | 17 | 1 | 0.0 | 50.7 | 66 | 50.7 | 10 | ---- | 50.7 | 0.0 | 8 | -8.0 |
| R-03 | 18 | 1 | 0.0 | 60.8 | 66 | 60.8 | 10 | ---- | 60.8 | 0.0 | 8 | -8.0 |
| R-04 | 19 | 1 | 0.0 | 56.7 | 66 | 56.7 | 10 | ---- | 56.7 | 0.0 | 8 | -8.0 |
| R-05 | 20 | 1 | 0.0 | 54.4 | 66 | 54.4 | 10 | ---- | 54.4 | 0.0 | 8 | -8.0 |
| R-06 | 21 | 1 | 0.0 | 53.2 | 66 | 53.2 | 10 | ---- | 53.2 | 0.0 | 8 | -8.0 |
| R-07 | 22 | 1 | 0.0 | 52.3 | 66 | 52.3 | 10 | ---- | 52.3 | 0.0 | 8 | -8.0 |
| R-08 | 23 | 1 | 0.0 | 51.8 | 66 | 51.8 | 10 | ---- | 51.8 | 0.0 | 8 | -8.0 |
| R-09 | 24 | 1 | 0.0 | 51.5 | 66 | 51.5 | 10 | ---- | 51.5 | 0.0 | 8 | -8.0 |
| R-10 | 25 | 1 | 0.0 | 62.4 | 66 | 62.4 | 10 | ---- | 62.4 | 0.0 | 8 | -8.0 |
| R-11 | 26 | 1 | 0.0 | 63.3 | 66 | 63.3 | 10 | ---- | 63.3 | 0.0 | 8 | -8.0 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R-12 | 27 | 1 | 0.0 | 59.7 | 66 | 59.7 | 10 | ---- | 59.7 | 0.0 | 8 | -8.0 |
| R-13 | 28 | 1 | 0.0 | 59.2 | 66 | 59.2 | 10 | ---- | 59.2 | 0.0 | 8 | -8.0 |
| R-14 | 29 | 1 | 0.0 | 58.9 | 66 | 58.9 | 10 | ---- | 58.9 | 0.0 | 8 | -8.0 |
| R-15 | 30 | 1 | 0.0 | 58.7 | 66 | 58.7 | 10 | ---- | 58.7 | 0.0 | 8 | -8.0 |
| R-16 | 31 | 1 | 0.0 | 61.2 | 66 | 61.2 | 10 | ---- | 61.2 | 0.0 | 8 | -8.0 |
| R-17 | 32 | 1 | 0.0 | 59.4 | 66 | 59.4 | 10 | ---- | 59.4 | 0.0 | 8 | -8.0 |
| R-18 | 33 | 1 | 0.0 | 58.7 | 66 | 58.7 | 10 | ---- | 58.7 | 0.0 | 8 | -8.0 |
| R-19 | 34 | 1 | 0.0 | 59.9 | 66 | 59.9 | 10 | ---- | 59.9 | 0.0 | 8 | -8.0 |
| R-20 | 35 | 1 | 0.0 | 45.1 | 66 | 45.1 | 10 | ---- | 45.1 | 0.0 | 8 | -8.0 |
| R-21 | 36 | 1 | 0.0 | 60.9 | 66 | 60.9 | 10 | ---- | 60.9 | 0.0 | 8 | -8.0 |
| R-22 | 37 | 1 | 0.0 | 54.9 | 66 | 54.9 | 10 | ---- | 54.9 | 0.0 | 8 | -8.0 |
| R-23 | 38 | 1 | 0.0 | 49.4 | 66 | 49.4 | 10 | ---- | 49.4 | 0.0 | 8 | -8.0 |
| R-24 | 39 | 1 | 0.0 | 50.6 | 66 | 50.6 | 10 | ---- | 50.6 | 0.0 | 8 | -8.0 |
| R-25 | 40 | 1 | 0.0 | 53.5 | 66 | 53.5 | 10 | ---- | 53.5 | 0.0 | 8 | -8.0 |
| R-26 | 41 | 1 | 0.0 | 55.6 | 66 | 55.6 | 10 | ---- | 55.6 | 0.0 | 8 | -8.0 |
| R-27 | 42 | 1 | 0.0 | 65.6 | 66 | 65.6 | 10 | ---- | 65.6 | 0.0 | 8 | -8.0 |
| R-28 | 43 | 1 | 0.0 | 64.5 | 66 | 64.5 | 10 | ---- | 64.5 | 0.0 | 8 | -8.0 |
| R-29 | 44 | 1 | 0.0 | 64.2 | 66 | 64.2 | 10 | ---- | 64.2 | 0.0 | 8 | -8.0 |
| R-30 | 45 | 1 | 0.0 | 64.0 | 66 | 64.0 | 10 | ---- | 64.0 | 0.0 | 8 | -8.0 |
| R-31 | 46 | 1 | 0.0 | 64.0 | 66 | 64.0 | 10 | ---- | 64.0 | 0.0 | 8 | -8.0 |
| R-32 | 47 | 1 | 0.0 | 59.2 | 66 | 59.2 | 10 | ---- | 59.2 | 0.0 | 8 | -8.0 |
| R-33 | 48 | 1 | 0.0 | 64.2 | 66 | 64.2 | 10 | ---- | 64.2 | 0.0 | 8 | -8.0 |
| R-34 | 49 | 1 | 0.0 | 58.9 | 66 | 58.9 | 10 | ---- | 58.9 | 0.0 | 8 | -8.0 |
| R-35 | 50 | 1 | 0.0 | 58.2 | 66 | 58.2 | 10 | ---- | 58.2 | 0.0 | 8 | -8.0 |
| R-36 | 51 | 1 | 0.0 | 61.5 | 66 | 61.5 | 10 | ---- | 61.5 | 0.0 | 8 | -8.0 |
| R-37 | 52 | 1 | 0.0 | 56.4 | 66 | 56.4 | 10 | ---- | 56.4 | 0.0 | 8 | -8.0 |
| R-38 | 53 | 1 | 0.0 | 64.5 | 66 | 64.5 | 10 | ---- | 64.5 | 0.0 | 8 | -8.0 |
| R-39 | 54 | 1 | 0.0 | 58.3 | 66 | 58.3 | 10 | ---- | 58.3 | 0.0 | 8 | -8.0 |
| R-40 | 55 | 1 | 0.0 | 56.5 | 66 | 56.5 | 10 | ---- | 56.5 | 0.0 | 8 | -8.0 |
| R-41 | 56 | 1 | 0.0 | 56.7 | 66 | 56.7 | 10 | ---- | 56.7 | 0.0 | 8 | -8.0 |
| R-42 | 57 | 1 | 0.0 | 56.9 | 66 | 56.9 | 10 | ---- | 56.9 | 0.0 | 8 | -8.0 |
| R-43 | 58 | 1 | 0.0 | 56.8 | 66 | 56.8 | 10 | ---- | 56.8 | 0.0 | 8 | -8.0 |
| R-44 | 59 | 1 | 0.0 | 58.5 | 66 | 58.5 | 10 | ---- | 58.5 | 0.0 | 8 | -8.0 |
| R-45 | 60 | 1 | 0.0 | 59.0 | 66 | 59.0 | 10 | ---- | 59.0 | 0.0 | 8 | -8.0 |
| R-46 | 61 | 1 | 0.0 | 62.5 | 66 | 62.5 | 10 | ---- | 62.5 | 0.0 | 8 | -8.0 |
| R-47 | 62 | 1 | 0.0 | 64.4 | 66 | 64.4 | 10 | ---- | 64.4 | 0.0 | 8 | -8.0 |
| R-48 | 63 | 1 | 0.0 | 61.9 | 66 | 61.9 | 10 | ---- | 61.9 | 0.0 | 8 | -8.0 |
| R-49 | 64 | 1 | 0.0 | 61.8 | 66 | 61.8 | 10 | ---- | 61.8 | 0.0 | 8 | -8.0 |
| R-50 | 65 | 1 | 0.0 | 59.7 | 66 | 59.7 | 10 | ---- | 59.7 | 0.0 | 8 | -8.0 |
| R-51 | 66 | 1 | 0.0 | 62.2 | 66 | 62.2 | 10 | ---- | 62.2 | 0.0 | 8 | -8.0 |
| R-52 | 67 | 1 | 0.0 | 60.4 | 66 | 60.4 | 10 | ---- | 60.4 | 0.0 | 8 | -8.0 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R-53 | 68 | 1 | 0.0 | 61.4 | 66 | 61.4 | 10 | ---- | 61.4 | 0.0 | 8 | -8.0 |
| R-54 | 69 | 1 | 0.0 | 61.4 | 66 | 61.4 | 10 | ---- | 61.4 | 0.0 | 8 | -8.0 |
| R-55 | 70 | 1 | 0.0 | 61.5 | 66 | 61.5 | 10 | ---- | 61.5 | 0.0 | 8 | -8.0 |
| R-56 | 71 | 1 | 0.0 | 63.3 | 66 | 63.3 | 10 | ---- | 63.3 | 0.0 | 8 | -8.0 |
| R-57 | 72 | 1 | 0.0 | 58.4 | 66 | 58.4 | 10 | ---- | 58.4 | 0.0 | 8 | -8.0 |
| R-58 | 14 | 1 | 0.0 | 63.8 | 66 | 63.8 | 10 | ---- | 63.8 | 0.0 | 8 | -8.0 |
| R-59 | 73 | 1 | 0.0 | 61.4 | 8 | 61.4 | 10 | ---- | 61.4 | 0.0 | 8 | -8.0 |
| R-60 | 73 | 1 | 0.0 | 63.7 | 66 | 63.7 | 10 | ---- | 63.7 | 0.0 | 8 | -8.0 |
| R-61 | 74 | 1 | 0.0 | 57.6 | 66 | 57.6 | 10 | ---- | 57.6 | 0.0 | 8 | -8.0 |
| R-62 | 75 | 1 | 0.0 | 65.4 | 66 | 65.4 | 10 | ---- | 65.4 | 0.0 | 8 | -8.0 |
| R-63 | 76 | 1 | 0.0 | 51.8 | 66 | 51.8 | 10 | ---- | 51.8 | 0.0 | 8 | -8.0 |
| R-64 | 77 | 1 | 0.0 | 51.6 | 66 | 51.6 | 10 | ---- | 51.6 | 0.0 | 8 | -8.0 |
| R-65 | 78 | 1 | 0.0 | 51.3 | 66 | 51.3 | 10 | ---- | 51.3 | 0.0 | 8 | -8.0 |
| R-66 | 79 | 1 | 0.0 | 51.0 | 66 | 51.0 | 10 | ---- | 51.0 | 0.0 | 8 | -8.0 |
| R-67 | 80 | 1 | 0.0 | 51.5 | 66 | 51.5 | 10 | ---- | 51.5 | 0.0 | 8 | -8.0 |
| R-68 | 81 | 1 | 0.0 | 52.1 | 66 | 52.1 | 10 | ---- | 52.1 | 0.0 | 8 | -8.0 |
| R-69 | 82 | 1 | 0.0 | 52.9 | 66 | 52.9 | 10 | ---- | 52.9 | 0.0 | 8 | -8.0 |
| R-70 | 83 | 1 | 0.0 | 54.1 | 66 | 54.1 | 10 | ---- | 54.1 | 0.0 | 8 | -8.0 |
| R-71 | 84 | 1 | 0.0 | 55.7 | 66 | 55.7 | 10 | ---- | 55.7 | 0.0 | 8 | -8.0 |
| R-72 | 85 | 1 | 0.0 | 50.7 | 66 | 50.7 | 10 | ---- | 50.7 | 0.0 | 8 | -8.0 |
| R-73 | 86 | 1 | 0.0 | 52.9 | 66 | 52.9 | 10 | ---- | 52.9 | 0.0 | 8 | -8.0 |
| null | 88 | 1 | 0.0 | 65.8 | 66 | 65.8 | 10 | ---- | 65.8 | 0.0 | 8 | -8.0 |
| Receiver99 | 99 | 1 | 0.0 | 66.1 | 66 | 66.1 | 10 | Snd Lvl | 66.1 | 0.0 | 8 | -8.0 |
| Receiver107 | 107 | 1 | 0.0 | 66.1 | 66 | 66.1 | 10 | Snd Lvl | 66.1 | 0.0 | 8 | -8.0 |
| Receiver154 | 154 | 1 | 0.0 | 65.8 | 66 | 65.8 | 10 | ---- | 65.8 | 0.0 | 8 | -8.0 |
| Receiver159 | 159 | 1 | 0.0 | 66.3 | 66 | 66.3 | 10 | Snd Lvl | 66.3 | 0.0 | 8 | -8.0 |
| Receiver165 | 165 | 1 | 0.0 | 49.6 | 66 | 49.6 | 10 | ---- | 49.6 | 0.0 | 8 | -8.0 |
| Receiver172 | 172 | 1 | 0.0 | 45.7 | 66 | 45.7 | 10 | ---- | 45.7 | 0.0 | 8 | -8.0 |
| Receiver191 | 191 | 1 | 0.0 | 48.5 | 66 | 48.5 | 10 | ---- | 48.5 | 0.0 | 8 | -8.0 |
| Receiver207 | 207 | 1 | 0.0 | 49.7 | 66 | 49.7 | 10 | ---- | 49.7 | 0.0 | 8 | -8.0 |
| Receiver228 | 228 | 1 | 0.0 | 48.8 | 66 | 48.8 | 10 | ---- | 48.8 | 0.0 | 8 | -8.0 |
| Receiver236 | 236 | 1 | 0.0 | 65.6 | 66 | 65.6 | 10 | ---- | 65.6 | 0.0 | 8 | -8.0 |
| Receiver253 | 253 | 1 | 0.0 | 66.0 | 66 | 66.0 | 10 | Snd Lvl | 66.0 | 0.0 | 8 | -8.0 |
| Receiver269 | 269 | 1 | 0.0 | 65.7 | 66 | 65.7 | 10 | ---- | 65.7 | 0.0 | 8 | -8.0 |
| Receiver281 | 281 | 1 | 0.0 | 65.9 | 66 | 65.9 | 10 | ---- | 65.9 | 0.0 | 8 | -8.0 |
| Receiver296 | 296 | 1 | 0.0 | 65.9 | 66 | 65.9 | 10 | ---- | 65.9 | 0.0 | 8 | -8.0 |
| Receiver303 | 303 | 1 | 0.0 | 65.5 | 66 | 65.5 | 10 | ---- | 65.5 | 0.0 | 8 | -8.0 |
| Receiver309 | 309 | 1 | 0.0 | 66.4 | 66 | 66.4 | 10 | Snd Lvl | 66.4 | 0.0 | 8 | -8.0 |
| Receiver316 | 316 | 1 | 0.0 | 70.7 | 66 | 70.7 | 10 | Snd Lvl | 70.7 | 0.0 | 8 | -8.0 |
| Receiver323 | 323 | 1 | 0.0 | 69.3 | 66 | 69.3 | 10 | Snd Lvl | 69.3 | 0.0 | 8 | -8.0 |
| Receiver324 | 324 | 1 | 0.0 | 68.1 | 66 | 68.1 | 10 | Snd Lvl | 68.1 | 0.0 | 8 | -8.0 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Receiver325 | 325 | 1 | 0.0 | 65.9 | 66 | 65.9 | 10 | ---- | 65.9 | 0.0 | 8 | -8.0 |
| Receiver326 | 326 | 1 | 0.0 | 66.1 | 66 | 66.1 | 10 | Snd Lvl | 66.1 | 0.0 | 8 | -8.0 |
| Receiver333 | 333 | 1 | 0.0 | 65.9 | 66 | 65.9 | 10 | ---- | 65.9 | 0.0 | 8 | -8.0 |
| Receiver345 | 345 | 1 | 0.0 | 66.0 | 66 | 66.0 | 10 | Snd Lvl | 66.0 | 0.0 | 8 | -8.0 |
| Receiver351 | 351 | 1 | 0.0 | 66.1 | 66 | 66.1 | 10 | Snd Lvl | 66.1 | 0.0 | 8 | -8.0 |
| Receiver360 | 360 | 1 | 0.0 | 66.2 | 66 | 66.2 | 10 | Snd Lvl | 66.2 | 0.0 | 8 | -8.0 |
| Receiver370 | 370 | 1 | 0.0 | 66.3 | 66 | 66.3 | 10 | Snd Lvl | 66.3 | 0.0 | 8 | -8.0 |
| Receiver381 | 381 | 1 | 0.0 | 65.8 | 66 | 65.8 | 10 | ---- | 65.8 | 0.0 | 8 | -8.0 |
| Receiver395 | 395 | 1 | 0.0 | 65.9 | 66 | 65.9 | 10 | ---- | 65.9 | 0.0 | 8 | -8.0 |
| Receiver406 | 406 | 1 | 0.0 | 66.0 | 66 | 66.0 | 10 | Snd Lvl | 66.0 | 0.0 | 8 | -8.0 |
| Receiver418 | 418 | 1 | 0.0 | 65.9 | 66 | 65.9 | 10 | ---- | 65.9 | 0.0 | 8 | -8.0 |
| Receiver431 | 431 | 1 | 0.0 | 66.2 | 66 | 66.2 | 10 | Snd Lvl | 66.2 | 0.0 | 8 | -8.0 |
| Receiver438 | 438 | 1 | 0.0 | 65.8 | 66 | 65.8 | 10 | ---- | 65.8 | 0.0 | 8 | -8.0 |
| Receiver477 | 477 | 1 | 0.0 | 66.0 | 66 | 66.0 | 10 | Snd Lvl | 66.0 | 0.0 | 8 | -8.0 |
| Receiver486 | 486 | 1 | 0.0 | 66.1 | 66 | 66.1 | 10 | Snd Lvl | 66.1 | 0.0 | 8 | -8.0 |
| Receiver510 | 510 | 1 | 0.0 | 65.8 | 66 | 65.8 | 10 | ---- | 65.8 | 0.0 | 8 | -8.0 |
| Receiver527 | 527 | 1 | 0.0 | 66.2 | 66 | 66.2 | 10 | Snd Lvl | 66.2 | 0.0 | 8 | -8.0 |

| **Dwelling Units** | **# DUs** | **Noise Reduction** | | |
|---|---|---|---|---|
| | | **Min** | **Avg** | **Max** |
| | | **dB** | **dB** | **dB** |
| All Selected | 122 | 0.0 | 0.0 | 0.0 |
| All Impacted | 28 | 0.0 | 0.0 | 0.0 |
| All that meet NR Goal | 0 | 0.0 | 0.0 | 0.0 |